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Department of Earth Sciences • College of Earth, Ocean, and Environment • University of Delaware
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EDUCATION

Massachusetts Institute of Technology Cambridge, MA
Ph.D., Hydrology, February 2005
Department of Civil and Environmental Engineering

University of Notre Dame Notre Dame, IN
B.S., Civil Engineering, Summa Cum Laude, June 1998
Department of Civil Engineering and Geological Sciences

EXPERIENCE

University of Delaware Newark, DE
Director, Delaware Environmental Institute (September 2021-present)
Professor, Department of Earth Sciences (September 2019-present)
Interim Director, Delaware Environmental Institute (September 2019-September 2020)
Associate Director for Interdisciplinary Initiatives, Delaware Environmental Institute (September 2017-September 2021)
Associate Professor, Department of Geological Sciences (September 2014-September 2019)
Unidel Fraser Russell Career Development Chair in the Environment (September 2013-present)
Assistant Professor, Department of Geological Sciences (September 2008 – September 2014)
Joint Appointment, Department of Civil and Environmental Engineering
Joint Faculty, Department of Geography
Joint Faculty, School of Marine Science and Policy

Flinders University Adelaide, Australia
Visiting Professor, School of Earth Sciences (October 2014-May 2015)

Stanford University Stanford, CA
Postdoctoral Researcher, Departments of Geological and Environmental Sciences and Energy Resources Engineering (January 2007-August 2008)

United States Geological Survey Reston, VA
National Research Council Postdoctoral Research Associate (December 2004 –December 2006)

HONORS and AWARDS

- Geological Society of America James B. Thompson, Jr. International Distinguished Lectureship (2018-2019)
- National Academy of Engineering Kavli Fellow (2014)
- Water Resources Research Editor's Choice Award for Heiss and Michael (2014)
- Unidel Fraser Russell Career Development Chair in the Environment, University of Delaware (2013)
- National Science Foundation CAREER Award (2012)
- National Academy of Sciences Kavli Fellow (2012)
- Distinguished Oliver Lecturer, Jackson School of Geosciences, University of Texas (2011)
- Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Award (2010)
- National Research Council RAP Postdoctoral Research Fellowship (2004-2006)
- National Science Foundation Graduate Research Fellowship (1998-2002)
- Massachusetts Institute of Technology Hydrology Fellowship (2001)

- Thomas A. Steiner Prize for excellence in the Notre Dame College of Engineering (1998)
- Walter L. Shilts Award for undergraduate achievement in Civil Engineering (1998)

RESEARCH INTERESTS

- Coastal groundwater dynamics
- Submarine groundwater discharge and associated chemical fluxes
- Groundwater-surface water interaction
- Groundwater flow and solute transport modeling
- Water supply sustainability
- Water resources in developing countries
- Geostatistical modeling of subsurface heterogeneity
- Hydro-economics

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union
- Geological Society of America
- International Association of Hydrogeologists
- International Association of Mathematical Geosciences

JOURNAL PUBLICATIONS

*corresponding author

(I am usually listed last on publications for which *students or postdocs under my supervision* are first author)

Published or In Press (112)

Zhang, Z*, C Lu*, H Fang, J Luo, **HA Michael**, AM Wilson (2025) Transport mechanisms of conservative deep-layer contaminants from tidally influenced semi-confined aquifers to the sea, Geophysical Research Letters, *in press*.

Kretschmer, D*, **HA Michael**, N Moosdorf, GHP Oude Essink, MFP Bierkens, T Wagener, R Reinecke (2025) Controls on coastal saline groundwater across North America, Environmental Research Letters, 20, 024065, doi: 10.1088/1748-9326/ada973.

Kretschmer, D*, **HA Michael**, N Moosdorf, G Oude-Essink, M Bierkens, T Wagener, R Reinecke (2025) A perceptual model of drivers and limiters of coastal groundwater dynamics, Hydrological Processes, 39(1), e70058, doi: 10.1002/hyp.70058.

Geng, X*, **HA Michael**, JW Heiss, M Boufadel, H Li, Y Zhang (2025) Groundwater flow and salinity dynamics in swash zones: Combined effects of evaporation, waves, and geologic heterogeneity, Journal of Hydrology, 646, 132322, doi: 10.1016/j.jhydrol.2024.132322.

Fagherazzi, S*, G Nordio, J Boaga, G Cassiani, **HA Michael**, D Pratt, TC Messerschmidt, ML Kirwan, S Stotts (2024) The ecohydrology of coastal ghost forests, Ecohydrology, 18:e70020, doi: 10.1002/eco.70020.

Guimond, JA*, E Grande, **HA Michael**, D Pratt, E Herndon, GL Noyce, ND Ward, I Forbrich, P Regier, MJ Berens, B Arora (2024) The hidden influence of terrestrial groundwater on salt marsh function and resilience, Nature Water, 3, 157–166, doi: 10.1038/s44221-024-00384-6.

Geng, X*, **HA Michael**, J Heiss, M Boufadel, H Li, X Wang (2024) Influence of evaporation and high-frequency seawater inundation on salinity dynamics in swash zones, Water Resources Research, 60(11), e2024WR037427, doi: 10.1029/2024WR037427.

Frederiks, R, G Carleton, A Paldor, **HA Michael*** (2024) A comparison of sea-level rise and storm-surge overwash effects on groundwater salinity of a barrier island, Journal of Hydrology, 644, 132050, doi: 10.1016/j.jhydrol.2024.132050.

Nordio, G*, DL Pratt, **HA Michael**, S Fagherazzi (2024) Initial soil moisture and soil texture control the impact of storm surges in coastal forests, Science of the Total Environment, 953, 175911, doi: 10.1016/j.scitotenv.2024.174102.

Paldor, A, C Bertoni, B Penny, **HA Michael*** (2024) Offshore freshened groundwater reservoirs controlled by submarine faults with a complex dependency on antecedent hydrogeological conditions, Science of the Total Environment, doi: 10.1016/j.scitotenv.2024.175834.

Hingst, MA, R Housego, C He, L Ball, B Minsley, **HA Michael*** (2024) Beyond the wedge: Impact of tidal streams on salinization of groundwater in a coastal aquifer stressed by pumping and sea-level rise, Water Resources Research, 60(10), e2023WR035840, doi: 10.1029/2023WR035840.

Frederiks, RS, A Paldor, L Donati, G Carleton, **HA Michael*** (2024) Drivers of barrier island water-table fluctuations and groundwater salinization, Science of the Total Environment, doi: 10.1016/j.scitotenv.2024.174102.

Kirwan, M*, **HA Michael**, KB Gedan, KL Tully, S Fagherazzi, NG McDowell, GD Molino, D Pratt, WG Reay, S Stotts (2024) Feedbacks regulating the salinization of coastal landscapes, Nature Reviews Earth and Environment, 17, doi: 10.1146/annurev-marine-070924-031447.

Fettrow, S, A Wozniak, **HA Michael**, A Seyfferth* (2024) Factors controlling spatiotemporal variability of soil carbon accumulation and stock estimates in a tidal salt marsh, Biogeosciences, 21(9), 2367-2384, doi: 10.5194/bg-21-2367-2024.

Wilson, S, A Moody, T McKenzie, MB Cardenas, E Luijendijk, AH Sawyer, A Wilson, **HA Michael**, B Xu, KL Knee, H-M Cho, Y Weinstein, A Paytan, N Moosdorf, C Chen-Tung, M Beck, C Lopez, D Murgulet, G Kim, M Charette, H Waska, JSP Ibanhez, G Chaillou, T Oehler, S Onodera, M Saito, V Rodellas, N Dimova, D Montiel, H Dulai, J Du, E Peterman, X Chen, KL Davis, S Lamontagne, R Sugimoto, G Want, H Li, AI Torres, C Demir, E Bristol, CT Connolly, JW McClelland, BJ Silva, D Tait, BSK Kumar, R Viswanadham, VVSS Sarma, E Silva-Filho, A Shiller, A Lecher, J Tamborski, H Bokuniewicz, C Rocha, A Reckhardt, ME Bottcher, S Jiang, T Stieglitz, C Charbonnier, P Anschutz, LMH Terrones, S Babu, B Szymczycha, M Sadat-Noori, F Niencheski, K Null, C Tobias, B Song, IC Anderson, IR Santos (2024) Global subterranean estuaries modify groundwater nutrient loading to the ocean, Limnology and Oceanography Letters, 9(4), 411-422, doi: 10.1002/lol2.10390.

Richardson, CM*, KL Davis, C Ruiz-Gonzalez, JA Guimond, **HA Michael**, A Paldor, N Moosdorf, A Paytan (2024) The impacts of climate change on groundwater at the coast, Nature Reviews Earth and Environment, doi: 10.1038/s43017-023-00500-2.

Stanic, S, A Paldor, AA Mohammed, **HA Michael**, N LeRoux, and BL Kurylyk* (2023) Saltwater intrusion into a confined island aquifer driven by erosion, changing recharge, sea-level rise, and coastal flooding, Water Resources Research, 60(1), e2023WR036394, doi: 10.1029/2023WR036394.

Chen X*, D Dwivedi, **HA Michael** (2023) Editorial: Hydrology, ecology, and nutrient biogeochemistry at the terrestrial-aquatic interface, Frontiers in Environmental Science, 11:1322708, doi: 10.3389/fenvs.2023.1322708.

Fettrow, S, V Jeppi, A Wozniak, R Vargas, **HA Michael**, AL Seyfferth* (2023) Physiochemical Controls on the Horizontal Exchange of Blue Carbon Across the Salt Marsh-Tidal Channel Interface, Journal of Geophysical Research – Biogeosciences, <https://doi.org/10.1029/2023JG007404>.

Xu, Z, MR Khan, KM Ahmed, A Zahid, J Hariharan, P Passalacqua, E Steel, A Chadwick, C Paola, SL Goodbred Jr., *A Paldor*, **HA Michael*** (2023) Predicting subsurface architecture from surface channel networks in the Bengal Delta, Journal of Geophysical Research - Earth Surface, e2022JF006775.

Pan, F, K Xiao, Y Cai, H Li, Z Guo, X Wang, Y Zheng, C Zheng, BC Bostick, **HA Michael** (2023) Integrated effects of bioturbation, warming and sea-level rise on mobility of sulfide and metalloids in mangrove wetlands, Water Research, 233, 119788.

Arévalo-Martínez, DL*, A Haroon, HW Bange, E Erkul, M Jegen, N Moosdorf, JS von Deimling, C Berndt, ME Böttcher, J Hoffmann, V Liebetrau, U Mallast, G Massmann, A Micallef, **HA Michael**, H Paasche, W Rabbel, I Santos, J Scholten, K Schwalenberg, B Szymczycha, AT Thomas, JJ Virtasalo, H Waska, B Weymer (2023) Land-ocean connectivity through groundwater, Biogeosciences, 20(3), 647-662.

Jameel, Y*, M Stahl, **HA Michael**, B Bostick, A van Geen, CF Harvey (2023) Shift in groundwater recharge of the Bengal Basin from rainfall to surface water, Communications Earth and Environment, doi: 10.1038/s43247-022-00650-z.

Gangwal, U, AR Siders, J Horney, **HA Michael**, S Dong* (2023) Critical facility accessibility and road criticality assessment considering flood-induced partial failure, Sustainable and Resilient Infrastructure, doi: 0.1080/23789689.2022.2149184.

Nordio, G, *R Frederiks*, *M Hingst*, J Carr, K Gedam, **HA Michael**, M Kirwan, S Fagherazzi (2023) Frequent storm surges affect the groundwater of coastal ecosystems, Geophysical Research Letters, doi: 10.1029/2022GL100191.

Weymer, BA*, ME Everett, C Berndt, R Evans, A Haroon, M Jegen, A Micallef, **HA Michael**, VEA Post (2022) The coastal transition zone is an underexplored frontier in hydrology and geoscience, Communications Earth & Environment, 3, 323, doi: 10.1038/s43247-022-00655-8.

Hingst, MA, R McQuiggan, AS Andres, *C Peters*, **HA Michael*** (2022) Surface water-groundwater connections as pathways for inland salinization of coastal aquifers, Groundwater, doi: 10.1111/gwat.13274.

Yu, X, JJ LeMonte, J Stuckey, DL Sparks, JG Cargill, *CJ Russoniello*, **HA Michael*** (2022) Hydrologic control on arsenic cycling at the groundwater-surface water interface of a tidal channel, Environmental Science and Technology, doi: 10.1021/acs.est.2c05930.

Paldor, A, N Stark, M Florence, B Raubenheimer, S Elgar, R Housego, *R Frederiks*, **HA Michael*** (2022) Hydrogeological controls on the spatio-temporal variability of surge-induced hydraulic gradients along coastlines, Hydrology and Earth System Sciences, 26(23), 5987-6002.

Cantelon, J*, J Guimond, C Robinson, **HA Michael**, B Kurylyk (2022) Vertical saltwater intrusion in coastal aquifers driven by episodic flooding: A review, Water Resources Research, 58(11), doi: 10.1029/2022WR032614.

Hariharan, J, P Passalacqua, Z Xu, **HA Michael**, E Steel, A Chadwick, C Paola, AJ Moodie (2022) Modeling the dynamic response of river deltas to sea-level rise acceleration, Journal of Geophysical Research - Earth Surface, 127(9), e2022JF006762.

*Xu, Z, Hariharan, J, P Passalacqua, C Paola, E Steel, A Chadwick, C Paola, A Paldor, HA Michael** (2022) Effects of geologic setting on contaminant transport in deltaic aquifers, Water Resources Research, 58(9), doi: 10.1029/2022WR031943.

Khan, MR, HA Michael, EW Bresnyan, W Yu* (2022) Impacts of basin-wide irrigation pumping on dry-period stream baseflow in an alluvial aquifer with high seasonality, Hydrogeology Journal, , 30(6), 1899-1910, doi:0.1007/s10040-022-02527-z.

*Paldor, A, R Frederiks, HA Michael** (2022) Dynamic steady state in coastal aquifers is driven by multi-scale cyclical processes, controlled by aquifer storativity, Geophysical Research Letters, doi:10.1029/2022GL098599.

Kim, KH, JW Heiss, HA Michael, WJ Ullman, W-J Cai* (2022) Seasonal and spatial production patterns of dissolved inorganic carbon and total alkalinity in a shallow beach aquifer, Frontiers in Marine Science, 775.

Steel, E, C Paola, A Chadwick, J Hariharan, P Passalacqua, Z Xu, HA Michael, H Brommecker, E Hajek* (2022) Reconstructing subsurface sandbody connectivity from temporal evolution of surface networks, Basin Research, doi:10.1111/bre.12668.

Peters, CN, C Kimsal, RS Frederiks, A Paldor, R McQuiggan, HA Michael* (2022) Groundwater pumping causes salinization of coastal streams due to baseflow depletion: Analytical framework and application to Savannah River, GA, Journal of Hydrology, doi:10.1016/j.jhydrol.2021.127238.

*Yu, X, HA Michael** (2022) Impacts of the scale of representation of heterogeneity on simulated salinity and saltwater circulation in coastal aquifers, Water Resources Research, doi:10.1029/2020WR029523.

*Geng, X, HA Michael** (2021) Alongshore movement of groundwater and its effects on seawater-groundwater interactions in heterogeneous coastal aquifers, Water Resources Research, 57, e2021WR031056, doi:10.1029/2021WR031056.

*Gerges, F, H Nassif, X Geng, HA Michael, M Boufadel** (2021) GIS-based approach for evaluating a community intrinsic resilience index, Natural Hazards, doi: 10.1007/s11069-021-05094-w.

Stein, S, HA Michael, B Dugan* (2021) Injection of desalination brine into the saline part of the coastal aquifer; environmental and hydrological implications, Water Research, doi:10.1016/j.watres.2021.117820.

*Geng, X, JW Heiss, HA Michael, H Li, B Raubenheimer, M Boufadel** (2021) Geochemical fluxes in sandy coastal aquifers: Modulation due to major physical stressors and geologic heterogeneity, and nearshore morphology, Earth Science Reviews, doi:10.1016/j.earscirev.2021.103800.

*Xu, Z, Hariharan, J, P Passalacqua, C Paola, E Steel, HA Michael** (2021) Linking the Surface and Subsurface in River Deltas Part 2: Relating Subsurface Geometries and Groundwater Flow and Transport Behavior, Water Resources Research, doi: 10.1029/2020WR029281.

*Hariharan, J, Z Xu, HA Michael, C Paola, E Steel, P Passalacqua** (2021) Linking the Surface and Subsurface in River Deltas Part 1: Relating Surface and Subsurface Geometries, Water Resources Research, doi: 10.1029/2020WR029282.

Garcia-Orellana, J, V Rodellas Vila, J Tamborski, M Diego-Feliu, P van Beek, Y Weinstein, M Charette, A Alorda-Kleinglass, HA Michael, T Stieglitz, J Sholten* (2021) Ra isotopes as submarine groundwater discharge (SGD) tracers: review and recommendations, Earth Science Reviews, doi:10.1016/j.earscirev.2021.103681.

*Paldor, A, HA Michael** (2021) Storm surges cause simultaneous salinization and freshening of coastal aquifers, exacerbated by climate change, Water Resources Research, 57, e2020WR029213, doi:10.1029/2020WR029213.

Brooks, TW*, KD Kroeger, **HA Michael**, JK York (2021) Oxygen-controlled recirculating seepage meter reveals extent of nitrogen transformation in discharging coastal groundwater at the aquifer-estuary interface, Limnology and Oceanography, doi:10.1002/lno.11858.

Rocha, C*, CE Robinson, IR Santos, H Waska, **HA Michael**, HJ Bokuniewicz (2021) A place for subterranean estuaries in the coastal zone, Estuarine, Coastal and Shelf Science, doi:10.1016/j.ecss.2021.107167.

*Guimond, JA, HA Michael** (2021) Effects of marsh migration on flooding, saltwater intrusion, and crop yield in coastal agricultural land subject to storm surge inundation, Water Resources Research (joint special issue with Journal of Geophysical Research – Oceans), doi:10.1029/2020WR028326.

Micallef, A*, M Person, C Berndt, C Bertoni, D Cohen, B Dugan, R Evans, A Haroon, C Hensen, M Jegen, K Key, H Kooi, V Liebetrau, J Lofi, BJ Mailloux, R Martin-Nagle, **HA Michael**, T Müller, M Schmidt, K Schwalenberg, E Trembath-Reichert, B Weymer, Y Zhang, AT Thomas (2021) Offshore freshened groundwater in continental margins, Reviews of Geophysics, doi:10.1029/2020RG000706.

Geng, X, JW Heiss, **HA Michael**, MC Boufadel*, K Lee (2020) Groundwater flow and moisture dynamics in the swash zone: effects of heterogeneous hydraulic conductivity and capillarity, Water Resources Research, doi:10.1029/2020WR028401.

*Kim, KH, JW Heiss, X Geng, HA Michael** (2020) Modeling hydrologic controls on particulate organic carbon contributions to beach aquifer biogeochemical activity, Water Resources Research, doi:10.1029/2020WR027306.

Geng, X*, **HA Michael**, MC Boufadel, FJ Molz, F Gerges, K Lee (2020) Heterogeneity affects intertidal flow topology in coastal beach aquifers, Geophysical Research Letters, doi:10.1029/2020GL089612.

Duke, JM*, Z Liu, JF Suter, KD Messer, **HA Michael** (2020) Some taxes are better than others: An economic experiment analyzing groundwater management in a spatially explicit aquifer, Water Resources Research, doi:10.1029/2019WR026426.

Seyfferth, AL*, F Bothfield, R Vargas, JW Stuckey, J Wang, K Kearns, **HA Michael**, *J Guimond, X Yu*, DL Sparks (2020) Spatial and temporal heterogeneity of geochemical controls on carbon cycling in a tidal salt marsh, Geochimica et Cosmochimica Acta, doi:10.1016/j.gca.2020.05.013.

Heiss, JW*, **HA Michael**, M Koneshloo (2020) Denitrification hotspots in intertidal mixing zones linked to geologic heterogeneity, Environmental Research Letters, doi:10.1088/1748-9326/ab90a6.

Heiss, JW*, **HA Michael**, J Puleo (2020) Groundwater-surface water exchange in the intertidal zone detected by hydrologic and coastal oceanographic measurements, Hydrological Processes, doi:10.1002/hyp.13825.

Mozumder, MRH*, **HA Michael**, I Mihajlov, *MR Khan*, PSK Knappett, BC Bostick, BJ Mailloux, KM Ahmed, I Choudhury, T Koffman, T Ellis, K Whaley-Martin, R San Pedro, G Slater, M Stute, P Schlosser, and A van Geen (2020) Origin of groundwater arsenic in a rural Pleistocene aquifer in Bangladesh depressurized by distal municipal pumping, Water Resources Research, doi:10.1029/2020WR027178. (Selected for EOS Editor's Highlight, "Arsenic pollution in Bangladesh is catching up with deeper wells", Marc Bierkens, 3 August 2020).

Geng, X, **HA Michael*** (2020) Preferential flow enhances pumping-induced saltwater intrusion in volcanic aquifers, Water Resources Research (joint special issue with Journal of Geophysical Research – Oceans), doi:10.1029/2019WR026390.

Kreyns, P, X Geng, **HA Michael*** (2020) The influence of connected heterogeneity on groundwater flow and salinity distributions in coastal volcanic aquifers, Journal of Hydrology, doi:10.1016/j.jhydrol.2020.124863.

Guimond, JA, X Yu, AL Seyfferth, **HA Michael*** (2020) Using hydrological-biogeochemical linkages to elucidate carbon dynamics in coastal wetlands subject to relative sea-level rise, Water Resources Research (joint special issue with Journal of Geophysical Research – Oceans), doi:10.1029/2019WR026302.

Duque, C*, **HA Michael**, AM Wilson (2020) The subterranean estuary: Technical term, simple analogy, or source of confusion?, Water Resources Research (joint special issue with Journal of Geophysical Research – Oceans), <https://doi.org/10.1029/2019WR026554>.

Guimond, JA, A Seyfferth, KB Moffett, and **HA Michael*** (2020) Positive feedback between crabs and carbon efflux in coastal marshes, Environmental Research Letters, <https://doi.org/10.1088/1748-9326/ab60e2>.

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Duque, C*, K Knee, CJ Russoniello, M Sherif, O Aborisha, NC Sturchio, **HA Michael** (2019) Characterizing small-scale spatial variability of radium isotopes in submarine groundwater discharge, Journal of Hydrology, doi:10.1016/j.jhydrol.2019.124192.

Xiao, K*, H Li, Y Xia, AM Wilson, **HA Michael**, X Geng, E Smith, MC Boufadel, P Yuan, X Wang (2019) Effects of tidally-varying salinity on groundwater flow and salt transport: insights from modelling an idealized creek-marsh aquifer, Water Resources Research, doi:10.1029/2018WR024671.

Kim, KH, **HA Michael***, EK Field, WJ Ullman (2019) Hydrologic shifts create complex transient distributions of particulate organic carbon and biogeochemical responses in beach aquifers, Journal of Geophysical Research – Biogeosciences, doi:10.1029/2019JG005114.

Yu, X, **HA Michael*** (2019) Mechanisms, configuration typology, and vulnerability of pumping-induced seawater intrusion in heterogeneous aquifers, Advances in Water Resources, doi: 10.1016/j.advwatres.2019.04.013.

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Provost, AM*, AD Werner, VEA Post, **HA Michael**, CD Langevin (2018) Rebuttal to "The case of the Biscayne Bay and aquifer near Miami, Florida: density-driven flow of seawater or gravitationally driven discharge of deep saline groundwater?" by Weyer (Environ Earth Sci 2018, 77:1-16), Environmental Earth Sciences, 77:710, doi: 10.1007/s12665-018-7832-5.

Suter, JF*, S Collie, JM Duke, KD Messer, and **HA Michael** (2018) Common pool resource management at the extensive and intensive margins: Experimental evidence, Environmental and Resource Economics, doi: 10.1007/s10640-018-0283-3.

*Russoniello, CJ, JW Heiss, HA Michael** (2018) Variability in benthic exchange rate, mixing zone depth, and residence time in a shallow coastal estuary, Journal of Geophysical Research – Oceans, doi: 10.1002/2017JC013568.

Koneshloo, M, P Kreyens, HA Michael* (2018) Combining process-based and surface-based models to simulate subsurface heterogeneity in volcanic aquifers, Stochastic Environmental Research and Risk Assessment, doi: 10.1007/s00477-018-1511-7.

Yang, J, H Zhang, X Yu, T Graf, HA Michael* (2018) Assessing the impact of subsurface properties on groundwater salinization due to storm surge inundation, Advances in Water Resources, doi: 10.1016/j.advwatres.2017.11.017.

*Geng, X, JW Heiss, HA Michael, MC Boufadel** (2017) Subsurface flow and moisture dynamics in response to swash motions: Effects of beach hydraulic conductivity and capillarity, Water Resources Research, 58, 10317–10335, doi:10.1002/2017WR021248.

*Heiss, JW, VEA Post, T Laattoe, CJ Russoniello, HA Michael** (2017) Physical controls on biogeochemical processes in intertidal zones of beach aquifers, Water Resources Research, 53(11), 9225–9244, doi: 10.1002/2017WR021110.

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Michael, HA*, VEA Post, AM Wilson, AD Werner (2017) Science, society, and the coastal groundwater squeeze, Water Resources Research, 53 (4), 2610-2617, doi:10.1002/2017WR020851. (Part of the *Earth and Space Science* special collection, "Earth and Space Science is Essential for Society")

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Michael, HA*, *KC Scott, M Koneshloo, X Yu, MR Khan, K Li* (2016) Geologic influence on groundwater salinity drives large seawater circulation through the continental shelf, Geophysical Research Letters, 43, doi:10.1002/2016GL070863.

*Khan, MR, M Koneshloo, PSK Knappett, KM Ahmed, BC Bostick, BJ Mailloux, A Zahid, CF Harvey, A van Geen, and HA Michael** (2016) Mega-city pumping and preferential flow threaten groundwater quality, Nature Communications, 7:12833, doi:10.1038/ncomms12833.

*Yu, X, J Yang, T Graf, M Koneshloo, MA O'Neal, HA Michael** (2016) Impact of topography on groundwater salinization due to ocean surge inundation, Water Resources Research, 52, 5794-5812, doi: 10.1002/2016WR018814. (Publication highlights: AGU Universe 7(15), AGU Universe 7(18). HydroGeoSphere Research Highlight: <http://www.aquanty.com/blog/2016/9/19/hgs-research-highlight-topographic-control-on-groundwater-salinization-due-to-ocean-surge-inundation>. Figure used as Cover Art)

Knappett, PSK, BJ Mailloux, I Choudhury, MR Khan, HA Michael, S Barua, DR Mondal, MS Steckler, H Akhter, KM Ahmed, B Bostick, CF Harvey, M Shamsudduha, I Mihajlov, MR Mozumder, and A van Geen*

(2016) Vulnerability of intermediate and deep low-arsenic aquifers to municipal pumping in Bangladesh, Journal of Hydrology, doi:10.1016/j.jhydrol.2016.05.035.

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Michael, HA, JS Lubetsky, and CF Harvey* (2003) Characterizing submarine groundwater discharge: a seepage meter study in Waquoit Bay, Massachusetts, *Geophysical Research Letters*, 30, 1297, doi: 10.1029/2002GL016000.

REFEREED BOOK CHAPTERS, CONFERENCE PROCEEDINGS, AND REPORTS

Sullivan, PL*, D Genereux, A Brookfield, D Rempe, R Stotler, HR Barnard, L Karlstrom, J McIntosh, **HA Michael**, K Jarecke, RM Price, S Loheide, A White, K Singha (2024) Groundwater – the dynamic base of the CZ, in: Critical Zone and Ecosystems Dynamics, Springer.

Dimova, NT, AL Lecher, T McKenzie, and **HA Michael** (2024), Geochemical tracers for evaluating groundwater discharge and other processes in coastal areas, In: *Treatise on Geochemistry 3rd Edition*, Reference Module in Earth Systems and Environmental Sciences, Elsevier, doi: 10.1016/B978-0-323-99762-1.00013-9.

Knee, KL, NT Dimova, AL Lecher, T McKenzie, **HA Michael**, and A Paytan (2023) Submarine Groundwater Discharge: A source of nutrients, metals, and pollutants to the coastal ocean, In: D Baird and M Elliott (eds.) *Treatise on Estuarine and Coastal Science, 2nd Edition*, vol. 3, pp. 123-163. Oxford: Elsevier, <https://doi.org/10.1016/B978-0-323-90798-9.00065-2>.

McQuiggan, R., AS Andres, C He, *M Hingst*, T McKenna, and **HA Michael** (in press) Kent County Groundwater Monitoring Project: Hydrogeology and Salinization Dynamics of Eastern Kent County, Delaware Geological Survey, Report of Investigations No. 86.

Andres, AS, **HA Michael**, *CJ Russoniello*, *C Fernandez*, C He, and J Madsen (2017) Investigation of submarine groundwater discharge at Holts Landing State Park, Delaware: Hydrogeologic framework, groundwater level and salinity observations, Delaware Geological Survey Report of Investigations No. 80, 37 pp.

Cross, VA, JF Bratton, **HA Michael**, KD Kroeger, A Green, and E Bergeron (2013) Continuous resistivity profiling and seismic-reflection data collected in April 2010 from Indian River Bay, Delaware, US Geological Survey Open-File Report 2011-1039, 23 p., <http://dx.doi.org/10.3133/ofr20111039>.

Yu, W, CI Voss, **HA Michael**, KM Ahmed, L Feinson, *MR. Khan*, and A Tuinhof (2010) Implications of climate change on fresh groundwater resources in coastal aquifers in Bangladesh, Report of the World Bank, South Asia Reg., 2010, 105 pp.

Michael, HA, H Li, T Li, A Boucher, SM Gorelick, and J Caers (2008) Combining methods for geologically-realistic reservoir simulation, In: Proceedings of the Eighth International Geostatistics Congress, JM Ortiz and X Emery (eds.), Gecamin Ltd., Santiago, 1167-1172.

OTHER CONTRIBUTIONS

Pratt, D, RW McQuiggan, ES Bacmeister, *A Sprague-Getsy*, **HA Michael*** (2025) Groundwater and soil moisture data collected in the Coastal Critical Zone of the Delmarva Peninsula, United States, Journal of Hydrology, Data in Brief, *in press*.

Cox, J, **HA Michael**, J Miller (Executive Producers), B Hemmings, J Coppolino (Directors), *Salted Earth*, Independent film, 2023.

Awards:

Geological Documentary - Nature Without Borders International Film Festival 2023
Cinematography - Nature Without Borders International Film Festival 2023
Cinematography - New York SCIENCE & NATURE FEEDBACK Film & Screenplay Festival 2023
Environmental Honorable Mention - Montreal Independent Film Festival 2023
Best Documentary Honorable Mention – Panorama International Indie Film Festival 2024
Best Director Honorable Mention – Panorama International Indie Film Festival 2024
Best of the Fest – Ocean City Film Festival 2024

Film Festivals:

New York SCIENCE & NATURE FEEDBACK Film & Screenplay Festival (Fall 2023)
Symbiotic Film Festival, Ukraine (Fall 2023)
Nature Without Borders International Film Festival (Fall 2023)
Montreal Independent Film Festival, Montreal, Quebec, Canada (Fall 2023)
Friday Harbour Film Festival, Friday Harbor, WA (October 26th - 29th, 2023)
Red Rose Film Fest, Lancaster, PA (November 3rd - 4th, 2023)
Outer Banks Environmental Film Festival, Manteo, North Carolina. (November 10th, 2023)
Panorama International Indie Film Festival (2024)
Vyre Film Festival (2023)
Wake Forest Film Festival (March 1-2, 2024)
Ocean City Film Festival, Ocean City, MD (March 7-10, 2024)
Cinema Verde Environmental Film & Arts Festival, Gainesville, FL (2024)
Project Winterland Film Festival (2024)
Nairobi Design Week, Nairobi Kenya (March 9-17, 2024)
The Climate Reality Project, Climate Reality Training (Keynote speaker Al Gore), Salted Earth screened on a loop for the entire event (April 12-14, 2024)
Orlando International Film Festival (OIFF) (May 15-19, 2024)

Selected Screenings (most with panelists):

National Science Foundation Critical Zone Network conference, Salt Lake City, Utah (June 28, 2023)
National Science Foundation Critical Zone Network Education & Outreach group (August 16, 2023)
Delaware Environmental Institute, External Advisory Board (July 25, 2023)
University of Delaware Coast Day (October 1, 2023)
Stroud Water Research Center (Nov 15, 2023)
Citizen's Climate Lobby Mid-Atlantic Conference (February 25, 2024)
Lewes Public Library (April 24th, 2024)
Delaware Center for the Inland Bays (April 17, 2024)
Wild and Scenic Film Festival, Nevada City, CA (February 17-18, 2024)
St. Rose of Lima Catholic Parish, Gaithersburg, MD (March 11, 2024)
Salisbury University, US Fish and Wildlife (April 24, 2024)
University of Delaware Disaster Research Center Annual Workshop (May 2-4, 2024)
Idaho Museum of International Diaspora Conference, Climate on Culture, Galway, Ireland (September 18-20, 2024)
Osher Center for Life Long Learning (November 22, 2024)

Myers-Pigg, AN, [and 68 others including **HA Michael**, *D Pratt, A Sprague-Getsy*], Biogeochemistry of upland to wetland soils, sediments, and surface waters across Mid-Atlantic and Great Lakes coastal interfaces, 2023. <https://doi.org/10.1038/s41597-023-02548-7>.

Pennington, SC, [and 68 others including **HA Michael**, *D Pratt, A Sprague-Getsy*], EXCHANGE Campaign 1: A community-drive baseline characterization of soils, sediments, and water across coastal gradients, 2023. <https://doi.org/10.15485/1960313>.

Michael, HA, What is seawater intrusion? A hydrologist explains the shifting balance between fresh and salt water at the coast. *The Conversation*, October 11, 2023. <https://theconversation.com/what-is-seawater-intrusion-a-hydrogeologist-explains-the-shifting-balance-between-fresh-and-salt-water-at-the-coast-214620>.

Michael, HA, Opinion: Groundwater is Delaware's – and the world's – greatest hidden treasure, *Delaware News Journal*, March 20, 2022.

Brooks, TW*, KD Kroeger, **HA Michael**, B Szymczycha, M Eagle, and JK York (2021) Nearshore groundwater seepage and geochemical data measured in 2015 at Guinea Creek, Rehoboth Bay, Delaware: data release DOI:10.5066/P94NBY3Z, U.S. Geological Survey, Reston, VA.

*Duque, C**, K Knee, *CJ Russoniello*, M Sherif, O Aborisha, NC Sturchio, **HA Michael** (2019) Submarine groundwater discharge data at meter scale (223Ra, 224Ra, 226Ra, 228Ra and 222Rn) in Indian River Bay (Delaware, US), *Journal of Hydrology, Data in brief*, 27, 104728, doi: 10.1016/j.dib.2019.104728.

Messer, K, and **HA Michael**, Opinion: To stop trashing of Delaware's water supply, we must work together, *Delaware News Journal*, January 10, 2019.

SPONSORED RESEARCH and EDUCATION

Collaborative Research: RII Track-2 FEC: Risks, Impacts, & Strategies for Coastal Communities (RISCC): Advancing Convergent Science to Support Climate Change Adaptation & Resilience, **National Science Foundation EPSCoR Research Infrastructure Improvement**, (OIA2418394, 08/2024-07/2028), PI L Palm-Forster (UD), Co-PIs N David, S Clem, P Mondal, J Volk (UD), E Uchida, M Amini, P Liu, C Russoniello (University of Rhode Island), T Fournier (RI Sea Grant), N Levine (College of Charleston), A Wilson (University of South Carolina), A Guthrie (SC Sea Grant), Senior Personnel: **H Michael** (UD), \$3,013,400 (UD), 6,000,000 (total).

Saltwater intrusion monitoring network, Phase II, **Delaware Department of Natural Resources and Environmental Control**, (6/5/2024-9/30/2025), PI **H Michael** (UD), Co-PI R McQuiggan (Delaware Geological Survey), \$183,361 (total).

Integrated assessment of climate change impacts to groundwater, stormwater, and wastewater infrastructure at coastal military facilities, **Department of Defense Environmental Security Technology Certification Program (ESTCP)** (W912HQ24C0019, 4/25/2024-4/24/2028), PI C Voter (UD), Co-PIs H Michael, P Imhoff (UD), Larry Trout (Straughan Environmental), \$1,527,038 (UD, total).

Collaborative Research: Hydrogeophysical monitoring and modeling of heterogeneity in salinization processes across the marsh-upland transition, **National Science Foundation Hydrologic Sciences** (EAR 2316492/2316493, 7/27/23-7/26/26), PI L Slater (Rutgers Newark), Co-PIs D Ntarlagiannis (Rutgers Newark), **H Michael** (UD), \$255,765 (UD).

Effects of Saltwater Intrusion on DelDOT's Concrete Infrastructure, **Delaware Department of Transportation**, PI J McConnell, Co-PIs S Dong, M Head, H Malladi, J Maresca, C Meehan, K Messer, **H Michael**, J Tatar (UD), \$99,321 (UD, total).

Assessing the transport, transformation, and fate of per- and polyfluoroalkyl substances (PFAS) across the land-sea transition, **NIWR/USGS National Competitive Grant Program** (G23AP00044-00, 12/22-12/25), PI M Li (UD), Co-PIs H Michael (UD), A Tokranov, M Lorah, and E Majcher (USGS), \$250,000 (UD, total).

Predicting Trends in Subsurface Saltwater Intrusion due to Sea-Level Rise and Storm-Surge Inundation at Fire Island National Park, **Collaborative Research and Training Programs – Resources of the National Park System** (9/1/22-12/31/23), PI H Michael, \$59,707.

Impact of evaporation and waves on groundwater dynamics in tidally influenced beaches, **National Science Foundation Hydrologic Sciences** (EAR2130602, 2/15/22-1/31/25), PI M Boufadel (NJIT), Co-PIs H Michael and X Geng (NOAA), \$176,789 (UD), \$425,115 (total).

Salinity Intrusion of Freshwater via Sea Level Rise at Assateague Island National Seashore, Maryland, **Collaborative Research and Training Programs – Resources of the National Park System** (P21AC11549, 9/1/21-8/31/22), PI H Michael, \$56,807.

Network Cluster: The Coastal Critical Zone: Processes that transform landscapes and fluxes between land and sea, **NSF Critical Zone Collaborative Network** (EAR2012484, 9/1/20-8/31/25), Lead PI H Michael, PIs Y-P Chin, J Miller, A Seyfferth (UD), M Kirwan (VIMS), K Tully (UMD), K Gedan (George Washington), S Fagherazzi (BU), S Stotts (Wesley College), \$2,078,324 (UD), \$4,160,000 (total).

Measurements and Modeling to Improve Prediction of Vulnerability of Coastal Water Resources and Ecosystems to Salinization by Storm Surges and Sea-Level Rise, **NIWR/USGS National Competitive Grant Program** (2018DE01G, 9/1/18-8/31/22), Lead PI H Michael, Co-PIs X Yu (UD) and G Carleton (USGS), \$195,215 (UD).

Convergence: RAISE Nearshore Water-Land Interface During Extreme Storms, **National Science Foundation Physical Oceanography and Hydrologic Sciences** (OCE1848650, 9/15/18-8/31/21) Lead PI B Raubenheimer (WHOI), PIs Steve Elgar (WHOI), H Michael, QJ Chen (Northeastern), L Moore (UNC-Chapel Hill), N Stark (Virginia Tech), \$62,430 (UD), \$999,941 (total).

Connecting Hydrology, Biology, and Geochemistry in a Coastal Wetland: Feedbacks between Ecosystem Processes toward Predictive Understanding, **National Science Foundation Hydrologic Sciences** (EAR1759879, 8/1/18-7/31/22), Lead PI H Michael, PI A Seyfferth (UD), \$374,175.

RII Track-1: Water Security in Delaware's Changing Coastal Environment, **National Science Foundation EPSCoR Research Infrastructure Improvement and the State of Delaware** (OIA1757353, 10/1/18-9/31/23), Lead PI K Messer, PI and Research Lead, H Michael, PIs V Kalavacharla, D Sparks, M D'Souza, \$1,400,000 (Michael portion), \$23,000,000 (total).

Characterizing global variability in groundwater arsenic, **USGS Powell Center** (10/1/18-7/31/22), PI B Bostick (Lamont-Doherty Earth Observatory), Co-PIs M Stahl (Union College), C Voss (USGS), H Michael, \$153,929.

Water Sustainability Challenges Graduate Student Symposia, **University of Delaware Office of Graduate and Professional Education Grand Challenges** (2/1/18-6/15/19), PI H Michael, PIs J Miller, DL Sparks, D Vlachos, Y Yan, S Inamdar, S Ali, K Messer, Y Chin, A Razdan, S Freilich (UD), D Arscott (Stroud Water Research Center), T Keyser, Ed Hale (Delaware Department of Natural Resources and Environmental Control), \$43,575.

Using surface information for quantitative modeling of the subsurface, **National Science Foundation Hydrologic Sciences** (EAR1719638, 9/1/17-8/31/20), Lead PI P Passalacqua (University of Texas), PIs H Michael and C Paola (University of Minnesota), \$282,371 (Michael portion), 831,000 (total).

CNH: Competing demands and future vulnerability of groundwater: Drinking water quality and food security in arsenic-impacted South and Southeast Asia, **National Science Foundation Coupled Natural Human Systems** (ICER1414131, 9/1/14-8/31/19), PI A van Geen (Columbia University), co-PIs B Bostick, W Schlenker, P Schlosser (Columbia University), C Harvey (MIT), H Michael (UD), J Duxbury (Cornell University), \$180,000 (Michael portion), \$1,450,000 (total).

Delaware EPSCoR: Meeting Delaware's 21st Century Water and Energy Challenges through Research, Education, and Innovation, **National Science Foundation EPSCoR RII and the State of Delaware** (EAR1301765, 6/1/2013-5/31/2018), Lead PI D Sparks, H Michael co-lead Research Theme 1, \$484,000 (Michael portion), \$24,000,000 (total).

Hydrological control of particle entrainment and nitrogen cycling in beach aquifer mixing and reaction zones, **National Science Foundation Hydrologic Sciences** (EAR1246554, 1/1/2013-12/31/17). Lead PI H Michael, PI W Ullman (UD), \$510,544.

CAREER: Quantitative education and analysis toward integrating scales of water exchange between land and sea, **National Science Foundation Hydrologic Sciences** (EAR1151733, 9/1/2012 – 8/31/2018). PI H Michael, \$665,010.

Health Effects and Geochemistry of Arsenic and Manganese, **NIEHS Superfund Research Program** (4/1/2012-3/31/2017), Lead PIs J Graziano and A van Geen (Columbia University), H Michael co-PI on Hydrogeology Core D, \$128,161 (Michael subcontract).

Christina River Basin CZO: a whole watershed approach to integrating feedbacks between water, mineral and carbon fluxes in human landscapes, **National Science Foundation** (EAR1331856), Lead PI J Pizzuto, co-PIs A Aufdenkampe, K Yoo, H Michael, J Kan, \$700,000 (total).

WSC Category 1 Water Sustainability in Coastal Environments: Exploratory Research for an Integrated Study of the Effect of Anticipated Sea Level Rise on Contaminated Site Risk, **National Science Foundation Water Sustainability and Climate** (SES1204672, 8/1/2012-7/31/2013). Lead PI J Duke, PIs D Sparks, H Michael, K Messer (UD), \$145,000.

Microbial Fe oxidation and carbon cycling in aquifers of the Christina River Critical Zone Observatory, **Delaware EPSCoR Seed Grant** (2/1/12 – 1/31/13), Lead PI C Chan (UD), PI H Michael, \$50,000.

An experimental economics investigation of groundwater resource dynamics, **National Science Foundation Decision, Risk, and Management Science**, co-supported by **Hydrologic Sciences**, Environment, Society, and the Economy (ESE) (SES1024889, 9/1/2010 – 8/31/2013), Lead PI J Suter (Oberlin College) PIs K Messer, J Duke, and H Michael (UD), \$273,219 (UD portion), \$369,483 (total).

Improving groundwater modeling in the Bengal Basin aquifer to support local and transboundary water-resources management in the lower Ganges River, **The World Bank** (8/1/2010-4/30/2012), PIs H Michael and C Voss (USGS), \$131,647 (Michael portion), \$165,000 (total).

Investigation of tidal effects on nitrogen chemistry in subsurface mixing zones of coastal estuaries, **Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Award** (6/1/2010-5/31/2011), PI H Michael, \$5000 (and \$5000 University match).

Quantifying Temporal and Geologic Controls on Water and Chemical Exchange between Groundwater and Surface Water in Coastal Estuarine Systems, **National Science Foundation Hydrologic Sciences** (EAR0910756, 10/1/2009-9/30/2013), Lead PI H Michael, PIs J Bratton and L Konikow (USGS), AS Andres (Delaware Geological Survey), D Krantz (University of Toledo), \$454,355 (UD portion), \$579,254 (total).

CZO: Spatial and temporal integration of carbon and mineral fluxes: a whole watershed approach to quantifying anthropogenic modification of critical zone carbon sequestration, **National Science Foundation** (NSF0724971, 10/1/2009-9/30/2014), funded Collaborator with Lead PI Donald Sparks and PIs K Yoo, J Pizzuto (UD), L Kaplan, A Aufdenkampe (Stroud Water Research Center), \$4,315,607 (total).

Recovering uncompromised samples of aquifer sands with in-situ groundwater from up to 300-m depth in South and Southeast Asia, **International Continental Scientific Drilling Program**, one of 10 lead proponents on a workshop proposal with lead PI A van Geen (Columbia University), \$46,750.

Fluid and fine-grained particle dynamics in the variably-saturated zone of sandy estuarine beachfaces, **Delaware EPSCoR Seed Grant** (2/1/2009 – 1/31/2011), Lead PI H Michael, PI W Ullman (UD), \$49,987.

Modeling dynamic effects of climate change on coastal groundwater systems, **University of Delaware Research Foundation** (6/1/2008 – 12/31/2009), PI H Michael, \$25,000.

Climate change implications on salt-water intrusion and groundwater resources in coastal aquifer systems in Bangladesh, **The World Bank** (4/1/2008 – 12/31/2009), PIs H Michael and C Voss (USGS), \$28,889 (Michael portion), \$120,000 (total).

Support for collaboration on groundwater modeling in Bangladesh and India and a MODFLOW workshop, **UNICEF** (2005-2006), PIs H Michael and C Voss (USGS), \$25,000.

Support for collaboration on groundwater modeling in Bangladesh and India and a MODFLOW workshop, **Department for International Development, UK** (2005), PIs H Michael and C Voss (USGS), \$18,000.

CONFERENCE SESSIONS ORGANIZED

Root, T, MC Sukop, S Habel, AM Wilson, **HA Michael**, B Kurylyk, C Russoniello, M Valencia, Coastal Hydrogeology in an Age of Rising Seas, Geological Society of America Annual Meeting, Anaheim, CA, 22-25 September 2024.

Folch, A, AH Sawyer, **HA Michael**, N Moosdorf, R Meyer, Integrating understanding across the land-ocean continuum: multidisciplinary approaches to studying saltwater intrusion and submarine groundwater discharge, European Geophysical Union, Vienna, Austria, 14-19 April 2024.

Folch, A, AH Sawyer, V Rodellas, **HA Michael**, Integrating understanding across the land-ocean continuum: multidisciplinary approaches to studying saltwater intrusion and submarine groundwater discharge, European Geophysical Union, Vienna, Austria, 23-28 April 2023.

Voisin, N, H Duerrast, J Guimond, **HA Michael**, Islands' Dynamic Hydrological Processes in a Changing World, AGU Frontiers in Hydrology Meeting, San Juan, Puerto Rico, 19-24 June, 2022.

Friedrich, J, D Bellafigliore, D Borchardt, A D'Alpaos, **HA Michael**, M Rode, C Schwarz, C Zoccarato, From the source to the sea – rivers, estuaries, deltas, marshlands, and coastal seas under global change, European Geophysical Union General Assembly, 19-30 April, 2021.

Moftakhari, H, **HA Michael**, Coastal Hydrology, American Geophysical Union Fall Meeting, December 7-11, 2020.

Michael, HA, KC Carroll, C Hatch, JL Druhan, Advances, breakthroughs, and challenges in hydrogeologic sciences, American Geophysical Union Fall Meeting, Washington, DC, December 9-13, 2019.

Michael, HA I, C Hatch, KC Carroll, Advances, breakthroughs, and challenges in hydrogeologic sciences, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Michael, HA, C Hatch, Advances, breakthroughs, and challenges in hydrogeologic sciences, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

Carroll, K, **HA Michael**, P Mishra, B Malama, Recent advances in groundwater hydrology, American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16, 2016.

Michael, HA, K Carroll, C Brown, Water resources, climate change, and sustainability, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015.

Carroll, K, **HA Michael**, P Mishra, B Malama, Advances and breakthroughs in Hydrogeology, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015.

Sanford, W, **HA Michael**, C Welty, Delivery of nutrients and contaminants by groundwater to estuaries and their watersheds, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

Custodio, E, A Jeuken, SA Khan, **HA Michael**, G Oude Essink, Fresh Water Management, Deltas in Times of Climate Change II, Rotterdam, The Netherlands, September 24-26, 2014 (invited).

Michael, HA, KB Moffett, AH Sawyer, and T Bianchi, Hydrologic controls on biogeochemical and ecosystem processes at the land-sea interface, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2013.

Bhattacharya, P, A Mukherjee, DK Nordstrom, **HA Michael** and J Bundschuh, Recent Advances in Studies of Dissolved Arsenic and Other Metals in Global Hydrologic Systems, Geological Society of America Annual Meeting, Minneapolis, MN, October 9 - 12, 2011.

Andres, AS and **HA Michael**, Submarine Discharge of Groundwater and Nutrients into Estuaries and the Ocean, National Ground Water Association Ground Water Summit, Baltimore, MD, May 1-5, 2011.

Zheng, Y, and **HA Michael**, Sustainable Management of Safe Aquifers in Areas Affected by High Arsenic, Goldschmidt Conference on Earth, Energy, and the Environment, Knoxville, TN, June 13-18, 2010.

INVITED ABSTRACTS

*presenting author

Michael, HA*, The coastal sustainability paradox, Geological Society of America Annual Meeting, Anaheim, CA, 22-25 September 2024 (Pardee Keynote).

Michael, HA*, Mechanisms of salinization of coastal water resources and ecosystems: Insights from observations across the Mid-Atlantic, SALT Conference, Cambridge, MD, June 11-12, 2024

Michael, HA*, Untangling complexity at the land-sea margin, Modflow and More Conference, Princeton, NJ, 2-5 June, 2024 (Keynote).

Michael, HA*, *KH Kim, JW Heiss, X Geng, D Pratt, A Sprague-Getsy*, E Whitney, B Moyer, WJ Ullman, M Boufadel, Y-P Chin, K Tully, Hydrologic and geologic drivers of redox dynamics, biogeochemical hotspots,

and solute fluxes to coastal aquifers, Geological Society of America Meeting, Denver, CO, 9-12 October, 2022 (Invited).

Michael, HA*, X Yu, X Geng, and A Paldor, Connectivity of coastal water resources, submarine groundwater discharge, and offshore freshened groundwater, Atlantic Geoscience Society and Joint meeting of GAC-MAC-IAN-CNC-CSPG, Halifax, Canada, May 15-18, 2022 (Keynote).

Michael, HA*, *J Guimond*, Y-P Chin, S Fagherazzi, K Gedan, ML Kirwan, A Seyfferth, S Stotts, KL Tully, Drivers and impacts of marsh migration in the coastal critical zone, American Geophysical Union Fall Meeting, New Orleans, LA, December 13-17, 2021 (Invited).

Michael, HA*, *Z Xu*, J Hariharan, P Passalacqua, MR Khan, KM Ahmed, A Zahid, C Paola, E Steel, A Chadwick, From surface to subsurface: Connecting depositional processes and surface features to subsurface architecture and contaminant transport in deltaic aquifers, Geological Society of America Annual Meeting, Portland, Oregon, October 10-13, 2021. (Invited)

Passalacqua, P*, J Hariharan, **HA Michael**, C Paola, *Z Xu*, E Steel, A Chadwick, MR Khan, From surface to subsurface: Connectivity, metrics, and predictability of subsurface patterns from surface information, Geological Society of America Annual Meeting, Portland, Oregon, October 10-13, 2021. (Invited)

HA Michael*, *X Yu*, *X Geng*, *A Paldor*, The influence of geologic and hydrologic connectivity in coastal aquifers on offshore freshened groundwater, Geological Society of America Annual Meeting, October 29-31, 2020. (Invited)

HA Michael*, *M Khan*, CI Voss, CF Harvey, A van Geen, PSK Knappett, Vulnerability to groundwater arsenic in the Bengal Basin: The interplay between dense populations, geologic complexity, and large-scale geogenic contamination, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019. (Invited)

HA Michael*, *KH Kim*, WJ Ullman, CS Chan, S McAllister, Dynamic hydrologic and biogeochemical hotspots along coastlines as potential targets for biogeophysical investigation, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019. (Invited)

Michael, HA*, *X Yu*, Extending coastal hydrogeology from onshore to offshore: Geologic and hydrologic connections through the continental shelf, Geological Society of America Annual Meeting, Phoenix, AZ, September 25, 2019. (Invited)

Michael, HA*, *Z Xu*, J Hariharan, P Passalacqua, C Paola, E Steel, MC Perignon, Surface to subsurface connectivity in river deltas: From depositional processes to preferential groundwater flow, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018. (Invited)

Michael, HA* Climate, Population, and the Squeeze on Coastal Groundwater, Symposium on Water Sustainability, Hohai University, Nanjing, China, October 20-22, 2018. (Keynote)

Michael, HA*, Vulnerability of coastal aquifers to salinization by seawater: Influence of sea-level rise, storm surges, and geologic structure, Indo-US Bilateral Workshop on Coastal Groundwater Dynamics Combining Future Climate Change and Human Development, Pondicherry University, India, June 7-9, 2018. (Invited)

Michael, HA*, *KH Kim*, *JA Guimond*, *JW Heiss*, WJ Ullman, A Seyfferth, Hydrologic influence on redox dynamics in estuarine environments, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017. (Invited)

Michael, HA*, *C Duque, X Geng, J Guimond, JW Heiss, KH Kim, M Koneshloo, P Kreyns, CJ Russoniello, KC Scott, X Yu*, Submarine groundwater discharge across scales from marsh to shelf, Geological Society of America Annual Meeting, Seattle, WA, October 22-25, 2017. (Invited)

Michael, HA*, *KC Scott, X Yu, MR Khan, M Koneshloo*, Continental shelf-scale aquifer-ocean interactions: The impact of geological heterogeneity, Australasian Groundwater Conference, Sydney, Australia, July 11-13th, 2017. (Keynote)

Michael, HA*, *C Duque, JW Heiss, KH Kim, KC Scott, CJ Russoniello, TW Brooks, WJ Ullman*, Physical-biogeochemical linkages controlling land-sea solute fluxes from beach to shelf, American Society of Limnology and Oceanography Meeting, Honolulu, Hawaii, February 26-March 3, 2017. (Invited)

Michael, HA*, *X Yu, J LeMonte, DL Sparks, KH Kim, J Heiss, WJ Ullman, J Guimond, A Seyfferth*, Geochemical response to hydrologic change along land-sea interfaces, American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16, 2016. (Invited)

Michael, HA*, *J Heiss, KH Kim, WJ Ullman, CJ Russoniello, C Duque, TW Brooks*, The influence of groundwater flowpaths and mixing on nutrient fluxes to estuaries and the ocean, Geological Society of America Annual Meeting, Denver, CO, September 25-28, 2016. (Invited)

Michael, HA*, The influence of geologic heterogeneity on large-scale groundwater flow and solute transport: Continental shelves and mega-cities, Gordon Research Conference on Flow and Transport in Permeable Media, Girona, Spain, July 31-August 5, 2016. (Invited)

Michael, HA*, *KC Scott, M Koneshloo, MR Khan*, Geological Influence on Salinity Distributions and Submarine Groundwater Discharge on the Continental Shelf, 24th Salt Water Intrusion Meeting, Cairns, Australia, July 4-8, 2016 (Keynote).

Michael, HA*, *KC Scott, M Koneshloo, MR Khan, K Li*, The influence of geologic heterogeneity on groundwater salinity and aquifer-ocean exchange along the continental shelf, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015. (Invited)

Vargas, R*, **HA Michael**, *Z Sanchez, A Seyfferth*, Ecohydrology of greenhouse gas fluxes in a temperate estuary, American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2014. (Invited)

*AH Sawyer**, *O Lazareva, CS Chan, K Crespo, TC Stieglitz, HA Michael*, Shallow stratigraphic controls on fluid and solute fluxes across the sediment-water interface of an estuary, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2013. (Invited)

Michael, HA*, *LA Byron, LS Feinson, CI Voss, CJ Russoniello*, Vulnerability of topography-limited and recharge-limited groundwater systems to sea-level rise-induced salinization, American Geophysical Union Fall Meeting, San Francisco, CA, December 7, 2012. (Invited)

*Sawyer, AH**, *F Shi, JT Kirby, HA Michael*, Dynamic response of surface water-groundwater exchange to currents, tides, and waves in a shallow estuary, American Geophysical Union Fall Meeting, San Francisco, CA, December 7, 2012. (Invited)

Michael, HA*, Impacts of small-scale geologic heterogeneity on large-scale groundwater flow: Implications for sustainable arsenic-safe water supply in the Bengal Basin, The Geological Society of London, Water Futures Conference, London, England, March 6-7, 2012. (Invited)

Michael, HA*, Transport of Solutes through Hydraulically and Chemically Heterogeneous Sediments of the Bengal Basin, Goldschmidt Conference, Prague, Czech Republic, August 14-19, 2011. (Keynote)

Michael, HA*, CI Voss, KA Radloff, and Y Zheng, Assessment of the physical and chemical sustainability of deep, low-arsenic groundwater in the Bengal Basin: Regional- and local-scale considerations, American Geophysical Union Fall Meeting, San Francisco, CA, December 13-17, 2010. (Invited)

Michael, HA*, CI Voss, KA Radloff, and Y Zheng, Evaluation of water supply sustainability in the Bengal Basin through regional modeling of flow patterns and arsenic sorption, Geological Society of America Annual Meeting, Denver, CO, October 31 - November 3, 2010. (Invited)

Michael, HA* and CI Voss, Regional modeling of groundwater flow and arsenic transport in the Bengal Basin: challenges of scale and complexity, American Geophysical Union Fall Meeting, San Francisco, CA, December 14, 2009. (Invited)

Michael, HA* and CI Voss, Is deep groundwater a sustainable source of arsenic-safe water in the Bengal Basin? Management insights from a regional modeling analysis, AGU Chapman Conference on arsenic in groundwater of southern Asia, Siem Reap, Cambodia, March 24-27, 2009. (Invited)

Michael, HA*, Driving Mechanisms of Submarine Groundwater Discharge: Review of Recent Advancements and Observations in a Cape Cod Estuary, Geological Society of America Annual Meeting, Houston, TX, October 5-9, 2008. (Invited)

CONTRIBUTED ABSTRACTS

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2025 Powell, E*, T Fatoyinbo, **HA Michael**, *D Pratt*, Uncovering soil moisture boundaries and forest structure in transgressing forests with spaceborne SAR and lidar, Coastal and Estuarine Research Federation Biennial Conference, November 9-13, 2025.

*McGraw, A**, **HA Michael**, Evaluating drivers of the marsh-upland boundary in salt marsh transition zones, Coastal and Estuarine Research Federation Biennial Conference, November 9-13, 2025.

Kiro, Y*, **HA Michael**, C Duque Calvache, Quantifying long-term seawater circulation fluxes in coastal aquifers: insights from multi-element analysis and field applications, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

Kurylyk, B*, **HA Michael**, V Maselli, M Nedimovic, I Pavlovskii, S Yu, Coastal and offshore groundwater investigations for Prince Edward Island, Canada, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

Guimond, J*, E Grande, **H Michael**, B Arora, The overlooked role of terrestrial groundwater in coastal wetland resilience, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

*Pratt, D**, J Guimond, **HA Michael**, Dynamic drivers of marsh migration in the coastal critical zone: Untangling temporal and spatial variability, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

HA Michael*, Untangling complexity of the critical zone at the land-sea margin, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

*Chen, C**, A Paldor, *D Pratt*, **HA Michael**, Influence of tree mortality on salt distributions in changing coastal environments, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

*Paldor, A**, C Bertoni, **HA Michael**, Offshore freshened groundwater in the Levant Basin: Different modes of active land-sea connectedness dictate different hydrologic functioning, Salt Water Intrusion Meeting, Barcelona, Spain, June 1-6, 2025.

2024 *Pratt, D**, *A Paldor*, *C-Y Chen*, **HA Michael**, Balancing the seesaw: Quantifying the relative impacts of terrestrial and seaside forcings on coastal groundwater salinization, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

McQuiggan, RW*, **HA Michael**, B Scarborough, A Bataille, M Grabowski, Evaluating data gaps in Delaware's current saltwater intrusion monitoring, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

Noori, A*, G Nordio, *D Pratt*, T Messerschmidt, S Fettrow, A Seyfferth, ML Kirwan, **HA Michael**, S Fagherazzi, Evaluating hydrological heterogeneity and key drivers at the salt marsh-forest boundary in coastal areas, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

*Chen, C-Y**, *D Pratt*, Z Li, B Li, X Chen, **HA Michael**, Evaluation of coupled models to simulate the effects of marsh on saltwater intrusion under changing groundwater-surface water environments in coastal critical zone, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

*Junayed, TR**, *D Pratt*, R Leff, K Gedam, **HA Michael**, Salinity is dominant factor for soil water potential along transition zones in coastal forests, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

Yu, S*, B Kurylyk, **HA Michael**, Evolution of submarine groundwater system in the Gulf of St. Lawrence since the Last Glacial Maximum, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

Geng, X*, **HA Michael**, J Heiss, M Boufadel, Influence of evaporation and high-frequency seawater inundation on salinity dynamics in swash zones, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

*Peters, C**, *A Paldor*, *R Frederiks*, **HA Michael**, Coastal stream salinization due to baseflow depletion, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

Laboy, G*, EA Kebede, P Olaya, **HA Michael**, KF Davis, M Taufer, High-resolution (30m) mapping of irrigated areas using machine learning, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

*Zoccarato, C**, P Teatini, F Gatto, PSJ Minderhoud, **HA Michael**, M Cosma, L Tosi, S Donici, A Bergamasco, Mapping the spatial heterogeneity of tidal marsh deformation potential, American Geophysical Union Fall Meeting, Washington, DC, December 8-13, 2024.

Terra, C, *D Pratt*, L Slater, **HA Michael**, Investigating transport dynamics and salinity distribution trends during flooding events at coastal sites in the Delmarva Peninsula, International Meeting of Applied Geosciences and Energy, Houston, TX, August 26-29, 2024.

*Junayed, TR**, *D Pratt*, **HA Michael**, Salinity is dominant factor in root water uptake along transition zones in coastal forests, SALT conference, Cambridge, MD, June 11-12, 2024.

Pratt, D*, **HA Michael**, Hydrological mechanisms of salinization and flushing in the coastal critical zone, SALT Conference, Cambridge, MD, June 10-12, 2024.

Pratt, D*, J Guimond, E Bacmeister, **HA Michael**, Coastal drought drives salinization of groundwater along the marsh-upland boundary on the Delmarva Peninsula, Young Coastal Scientists & Engineers-Americas, Quebec City, Canada, June 4-6, 2024.

Kretschmer, D*, N Moosdorf, **HA Michael**, T Wagener, R Reinecke, Revealing dominant controls in a continental-scale model of submarine groundwater discharge and seawater intrusion by utilizing intrinsic model variability, European Geosciences Union, Vienna, Austria, April 14-19, 2024.

Boyer, E*, A Bhavna, E Aronson, H Barnard, S Holbrook, L Jin, P Kumar, **HA Michael**, J Monroe, J Perdrial, C Welty, J Reed, Exploring Earth's Critical Zone Through the U.S. Critical Zone Collaborative Network, European Geosciences Union, Vienna, Austria, April 14-19, 2024.

Michael, HA*, D Pratt, Y-P Chin, S Fagherazzi, K Gedan, M Kirwan, A Seyfferth, L Slater, S Stotts, K Tully, Hydrological, biogeochemical, and ecological linkages at the land-sea margin: Insights from a coastal critical zone network, European Geosciences Union, Vienna, Austria, April 14-19, 2024.

Igiraneza Sinyigenga, L*, **HA Michael**, D Pratt, R Leff, Exploring the impact of vegetation response to hydrological processes on evapotranspiration (ET) and water balance in the marsh-upland transition zones, Delaware Wetlands Conference, Wilmington, DE, February 6-7, 2024. *Won first prize for student presentations.*

Pratt, D*, ES Bacmeister, J Guimond, **HA Michael**, Coastal drought drives salinization of groundwater along the marsh-upland boundary on the Delmarva Peninsula, Delaware Wetlands Conference, Wilmington, DE, February 6-7, 2024.

2023 Housego, R*, M Hingst, C Peters, KL Tully, L Palm-Forster, **HA Michael**, An interdisciplinary framework for saltwater intrusion in coastal aquifers: Combining hydrologic modeling and socio-economic perspectives to improve mitigation strategies, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Perdrial, JN*, B Abbott, G Boissiere, L Jin, C Hatley, D Fairbanks, EW Boyer, L Ma, D Wheaton, L Li, N Spicer, DW Kincaid, L Lowman, EC Seybold, **HA Michael**, EM Andrews, ALD Dere, JB Shanley, N Hicks, B Cable, Exploring patterns and processes of Critical Zone (CZ) multidimensional resilience across the CZ collaborative network, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Boyer, BW*, EL Aronson, HR Barnard, S Holbrook, L Jin, P Kumar, D McCay, **HA Michael**, JS Munroe, JN Perdrial, JS Read, C Welty, CZNet: the United States Critical Zone Collaborative Network, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Pratt, D*, E Bacmeister, J Guimond, **HA Michael**, Coastal drought drives salinization of groundwater along the marsh-upland boundary on the Delmarva Peninsula, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Fagherazzi, S*, G Nordio, D Pratt, **HA Michael**, Initial soil moisture and soil texture control the impact of storm surges in coastal forests, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Terra, C*, *R Frederiks, A Paldor, J Robinson, TC Johnson, HA Michael, LD Slater*, Investigating the impact of partial flooding and electrode drift on coastal time-lapse electrical resistivity surveys, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Frederiks, R, J Raphael, K Gedan, HA Michael*, Effect of storm-surge frequency and sea-level rise on the ecosystem distribution of a barrier island, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Ball, LB*, *BJ Minsley, HA Michael*, Variations in the geometry of the freshwater-saline interface adjacent to the Delaware Bay revealed by airborne electromagnetics, American Geophysical Union Fall Meeting, San Francisco, CA, December 11-15, 2023.

Michael, HA*, *DL Pratt, Y-P Chin, S Fagherazzi, K Gedan, M Kirwan, A Seyfferth, L Slater, S Stotts, K Tully*, Marsh migration in the coastal critical zone: Drivers and impacts of hydrological, biogeochemical, and ecological change, European Geophysical Union, Vienna, Austria, April 23-28 2023.

Paldor, A, RS Frederiks, R Housego, B Raubenheimer, S Elgar, N Stark, HA Michael*, Harnessing integrated hydrologic modeling to analyze the coastal impacts of groundwater-surface water interactions on beach surface stability and freshwater availability, European Geophysical Union, Vienna, Austria, 23-28 April 2023.

Housego, R, A Paldor, R Frederiks, F Shi, HA Michael*, Using a surface water hydrodynamic model to understand how spatial variability in ocean surge affects groundwater salinization in Delaware Inland Bays, European Geophysical Union, Vienna, Austria, 23-28 April 2023.

Frederiks, RS, A Paldor, L Donati, HA Michael*, Groundwater resources in barrier islands are vulnerable to storm-surge salinization through various dominating processes, as revealed by data-based modeling, European Geophysical Union, Vienna, Austria, 23-28 April 2023.

Xie, L*, *K Messer, L Palm-Forster, M Masters, and HA Michael*, Buying Back Irrigation Water for Endangered Species Protection: Evidence from a Laboratory Experiment and a High-stakes Field Experiment with Farmers, Australasian Agricultural and Resource Economics Society Annual Conference, Feb 7-10, 2023.

2022 *Hingst, M*, C Peters, R Housego, HA Michael*, Hydrologic and economic assessment of converting farmland to solar fields to mitigate saltwater intrusion, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Whitney, E*, *A Sprague-Getsy, HA Michael, KL Tully, B Moyer, Y-P Chin*, Sea level rise impacts on the biogeochemistry of the coastal critical zone: Characterization of dissolved organic matter, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Terra, C*, *R Frederiks, A Paldor, HA Michael, LD Slater*, Time-lapse geophysical investigation of saltwater intrusion processes during storm surges on Assateague Island, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Pratt, D, G Nordio, S Fagherazzi, HA Michael*, The fast and slow hydrological drivers of marsh migration along the Delmarva Peninsula, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

*Housego, R**, F Shi, *A Paldor, R Frederiks, HA Michael*, Impact of ocean surge profiles on overwash-driven salinization in coastal aquifers, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Donati, L, R Frederiks, HA Michael, C Nolan, B Hulslander, B Sturgis, Analyzing the vulnerability of freshwater resources and drivers of pond salinization in a barrier island, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Frederiks, R, L Donati, A Paldor, J Raphael, HA Michael*, Assessing vulnerability of barrier islands to storm-surge induced groundwater salinization using a data-driven approach, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Reinecke, R, D Kretschmer, N Moosdorf, HA Michael*, T Wagener, Global coastal groundwater fluxes across spatial and temporal scales in the context of global change, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Paldor, A, B Penny, HA Michael*, C Bertoni, Land-to-sea fresh groundwater flow in deep aquifers and the importance of offshore faults in controlling the extent of circulation, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Sprague-Getsy, A, E Whitney, D Pratt*, HA Michael*, Influence of redox potential and hydrologic processes on DOC in the transition zone in salt marshes, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Aldred, P, A Paldor, R Frederiks, HA Michael*, Quantifying relative vulnerability of coastal typologies to storm surge salinization, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Fettrow, S, V Jeppi, AS Wozniak, HA Michael*, R Vargas, A Seyfferth, Biogeochemical cycling of blue carbon in coastal wetlands under rising seas, American Geophysical Union Fall Meeting, Chicago, IL, December 11-16, 2022.

Hingst, M, C Peters*, Ahsanuzzaman, L Palm-Forster, HA Michael*, Groundwater numerical modeling meets economic experimentation: How understanding of risk of saltwater intrusion affects water-user behavior, American Geophysical Union Chapman Conference, Golden, CO, 14 September, 2022.

Terra, C, R Frederiks, A Paldor, HA Michael, L Slater, Using Hydrologic Model Data to Inform Time-Lapse ERT Investigations of Coastal Processes, International Meeting for Applied Geoscience and Energy, Houston, TX, August 28-September 2, 2022.

Paldor, A, HA Michael, Differences in the hydrologic functioning of active offshore freshened groundwater systems – Comparing a volcanic and a carbonate system, International Workshop on Offshore Freshened Groundwater Research, Valetta, Malta, 27-28 June, 2022.

Hingst, M, C He, RW McQuiggan, AS Andres, HA Michael, Surface water-groundwater connections and their impact on seawater intrusion, AGU Frontiers in Hydrology Meeting, San Juan, Puerto Rico, 19-24 June, 2022.

Housego, R, F Shi, A Paldor, R Frederiks, HA Michael, Impact of ocean surge profiles on overwash-driven salinization in coastal aquifers, AGU Frontiers in Hydrology Meeting, San Juan, Puerto Rico, 19-24 June, 2022.

Pratt, D, HA Michael, The hydrological drivers of salinization and flooding in the coastal critical zone, AGU Frontiers in Hydrology Meeting, San Juan, Puerto Rico, 19-24 June, 2022.

Lemonte, J, X Yu, J Stuckey, D Sparks, J Cargill, C Russoniello, HA Michael*, Hydrologic controls on arsenic cycling at the groundwater-surface water interface of a tidal channel, Goldschmidt Conference, Hawaii, USA, July 10-15, 2022.

Kiro, Y, HA Michael, C Duque*, Data-driven quantification of subterranean estuaries role in ocean chemistry, Goldschmidt Conference, Hawaii, USA, July 10-15, 2022.

Kretschmer, D, R Reinecke, N Moosdorf, HA Michael, T Wagener*, Understanding coastal groundwater processes in a changing climate: A perceptual model of global-scale coastal groundwater dynamics, European Geophysical Union, May 23-27, 2022.

Zhang, J, AS Tarazouj, A Mathieu, T-J Hsu, HA Michael*, A numerical study on wave-driven ripple migration and benthic flux, THESIS-2022 Two-Phase Modeling for Sediment Dynamics Conference, Les Houches, France, June 6-10, 2022.

2021 *Peters, C*, C Kimsal, R Frederiks, A Paldor, RW McQuiggan, HA Michael*, Groundwater pumping causes salinization of coastal streams: Analytical assessment and application, American Geophysical Union Fall Meeting, New Orleans, LA, December 13-17, 2021.

Paldor, A, HA Michael*, Simultaneous freshening and salinization of coastal aquifers and response to cyclical forcings and climate change, American Geophysical Union Fall Meeting, New Orleans, LA, December 13-17, 2021.

Geng, X, M Boufadel, HA Michael*, Impacts of geologic heterogeneity on flow and mixing dynamics in coastal beach systems, American Geophysical Union Fall Meeting, New Orleans, LA, December 13-17, 2021.

Frederiks, R, A Paldor, HA Michael*, Future changes in coastal groundwater salinity due to sea-level rise and higher intensity and frequency storm surge at Assateague Island, MD, American Geophysical Union Fall Meeting, New Orleans, LA, December 13-17, 2021.

Hingst, M, RW McQuiggan, AS Andres, HA Michael*, Saltwater intrusion – early awareness leading to early mitigation, American Geophysical Union Fall Meeting, New Orleans, LA, December 13-17, 2021.

Khan, M, A van Geen, DM Ahmed, HA Michael*, Controls of lithology and groundwater pumping on arsenic contamination of deep groundwater in Bangladesh, The 8th International Congress & Exhibition on Arsenic in the Environment, The Netherlands, 7-9 June, 2021.

2020 *Peters, C*, HA Michael*, Well location influence on seawater intrusion in coastal aquifers, American Geophysical Union Fall Meeting, December 1-17, 2020.

Kiro, Y, HA Michael, C Duque, Y Yechieli, I Reznik*, Quantifying density-driven circulation in coastal aquifers based on water geochemistry, American Geophysical Union Fall Meeting, December 1-17, 2020.

Jameel, MY, M Stahl, HA Michael, CF Harvey*, Widespread pumping has altered groundwater recharge sources in the Bengal Basin: isotopic evidence, American Geophysical Union Fall Meeting, December 1-17, 2020.

*Hingst, M**, R McQuiggan, *C Peters*, A Andres, HA Michael, Driving mechanisms and timescales of saltwater intrusion near Dover, DE, IWRA Conference “Addressing Groundwater Resilience under Climate Change”, Virtual, October 28-30, 2020.

*Kimsal, C**, *C Peters*, *A Paldor*, *R Frederiks*, **HA Michael**, Groundwater levels and coastal stream salinization processes, Geological Society of America Annual Meeting, October 26-30, 2020.

Stanic, S*, AA Mohammed, *A Paldor*, B Kurylyk, **HA Michael**, Climate-driven saltwater intrusion dynamics in a confined small-island aquifer in Atlantic Canada, Geological Society of America Annual Meeting, October 26-30, 2020.

Kurylyk, B*, V Maselli, M Nedimovic, **HA Michael**, J Cantelon, A Mohammed, Coastal hydrogeology from the coast to the shelf: Emerging challenges in a changing world, Canadian Geophysical Union, Banff, Alberta, CA, May 3-6, 2020.

Steel, E*, C Paola, P Passalacqua, **HA Michael**, J Hariharan, Z Xu, Linking morphodynamics of deltaic distributary networks to stratigraphic connectivity of channel bodies, Society for Sedimentary Geology, April 26-29, 2020.

McQuiggan, R*, *M Hingst*, AS Andres, C He, *C Peters*, **HA Michael**, Investigating the dynamics of coastal groundwater salinization in East Dover, Delaware, GSA Joint Section Meeting, March 20-22, 2020.

Raubenheimer, B*, N Stark, Q Chen, S Elgar, **HA Michael**, L Moore, L Peek, Nearshore Extreme Events Reconnaissance (NEER) Association, AGU Ocean Sciences Meeting, San Diego, CA, February 16-21, 2019.

2019 *Dominguez, JP**, **HA Michael**, A Meglioli, Groundwater modeling in the high Andes of Argentina: resource assessment and potential impacts, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

*Guimond, J**, X Yu, **HA Michael**, Using hydrological-biogeochemical linkages to elucidate carbon dynamics in coastal wetlands subject to relative sea-level rise, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

*R Frederiks**, **HA Michael**, J Raphael, Quantifying vulnerability to storm surge induced saltwater intrusion in Atlantic coastal aquifers, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

*C Peters**, **HA Michael**, F Ahsanuzzaman, *M Hingst*, L Palm-Forster, Feedbacks Between Groundwater Pumping Decisions and Salinization Risks in Coastal Aquifers, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

*MR Khan**, **HA Michael**, B Nath, B Huhmann, CF Harvey, A Mukherjee, M Chakraborty, I Choudhury, MS Ullah, KM Ahmed, SL Goodbred, P Schlowwer, BC Bostick, BJ Mailloux, T Ellis, A van Geen, Arsenic-contaminated deep groundwater in the Bengal Basin: origin and implications for mitigation, San Francisco, CA, December 9-13, 2019.

Y Huang*, PSK Knappett, N Dimova, A Hossain, K Rhodes, M Lipsi, Z Nichols, I Choudhury, S Datta, MB Cardenas, KM Ahmed, **HA Michael**, RH Mozumder, A van Geen, Quantifying the timing and source of baseflow into the tidally fluctuating Meghna River, Bangladesh, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

*M Hingst**, R McQuiggan, AS Andres, *C Peters*, **HA Michael**, 'A-Salt' on Delaware Farmland: Investigation of Pathways and Dynamics of Saltwater Intrusion near Dover, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

*Xu, Z**, J Hariharan, P Passalacqua, E Steel, C Paola, **HA Michael**, Contaminant transport in deltaic aquifers: The impact of surface-to-subsurface connectivity, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

E Steel, C Paola, P Passalacqua, **HA Michael**, J Hariharan, *Z Xu*, Linking surface dynamics to the subsurface record: the effectiveness of overhead imagery in quantifying depositional architecture, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2019.

Yu, X, **HA Michael***, Offshore pumping impacts onshore groundwater resources and land subsidence, International Association of Mathematical Geologists Conference, State College, PA, August 12-15, 2019.

*Yu, X**, **HA Michael**, Mechanisms, classification, and vulnerability of pumping-induced seawater intrusion in heterogeneous aquifers, 16th Annual Meeting of Asia Oceania Geosciences Society, July 28 – August 2, 2019.

*Yu, X**, **HA Michael**, Mechanisms, classification, and vulnerability of pumping-induced seawater intrusion in heterogeneous aquifers, International Union of Geodesy and Geophysics General Assembly, Montreal, Canada, July 8-18, 2019.

Raubenheimer, B*, Q Chen, S Elgar, **HA Michael**, L Moore, N Stark, The nearshore water-land system during major storms, International Conference on Coastal Sediments, Tampa, FL, May 27-30, 2019.

*Guimond, JA**, **HA Michael**, Marsh crab impacts on hydrology and biogeochemistry alter coastal carbon cycling, Fourth Xiamen Symposium on Marine Environmental Sciences, Xiamen, China, January 6-9, 2019.

*Kim, KH**, **HA Michael**, WJ Ullman, Spatiotemporal variability of chemical reactions in a beach aquifer, Fourth Xiamen Symposium on Marine Environmental Sciences, Xiamen, China, January 6-9, 2019.

2018 *Kim, KH**, **HA Michael**, WJ Ullman, Short-timescale variability in redox conditions of a coastal aquifer, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

*Xu, Z**, **HA Michael**, J Hariharan, P Passalacqua, C Paola, MC Perignon, E Steel, Relations between static and dynamic connectivity in a deltaic aquifer, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

*Guimond, JA**, **HA Michael**, Marsh crab impacts on hydrology and biogeochemistry alter coastal carbon cycling, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

*Geng, X**, **HA Michael**, Lateral movement of groundwater and its effects on seawater-groundwater interactions in coastal volcanic aquifers, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Hariharan, J*, MC Perignon, P Passalacqua, *Z Xu*, **HA Michael**, C Paola, E Steel, Quantifying connectivity between the surface and subsurface in numerically modeled deltas, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Loheide, SP*, DM Ciruzzi, C Lowry, C Tague, **HA Michael**, DW Hyndman, AD Kendall, S Tyler, M Thompson, E Tran, CUAHSI Virtual University: An inter-institutional framework for graduate education applied to the hydrologic sciences, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Steel, E*, C Paola, P Passalacqua, **HA Michael**, Surface to subsurface connectivity in River Deltas: Building stratigraphy from limited surface information, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Mozumder, RH*, **HA Michael**, I Mihajlov, MR Khan, I Choudhury, BJ Mailloux, BC Bostick, P Knappett, P Schlosser, TNB Koffmann, T Ellis, KM Ahmed, A van Geen, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Heiss, J, **HA Michael**, M Koneshloo, Aquifer heterogeneity forms denitrification hotspots and increases reactivity in intertidal sediments, American Geophysical Union Fall Meeting, Washington, DC, December 10-14, 2018.

Michael, HA*, Vulnerability of coastal aquifers to salinization by seawater: Influence of sea-level rise, storm surges, and geologic structure, Geological Society of America Annual Meeting, Indianapolis, IN, November 4-7, 2018.

Van Geen, A*, RH Mozumder, B Bostick, B Mailloux, P Schlosser, CF Harvey, **HA Michael**, MR Khan, I Choudhury, KM Ahmed, How Earth processes can poison millions but also provide a solution: the case of well-water arsenic in South Asia, Geological Society of America Annual Meeting, Indianapolis, IN, November 4-7, 2018.

Yu, X, **HA Michael***, Effects of offshore pumping on groundwater resources in coastal aquifers, 25th Salt Water Intrusion Meeting, Gdansk, Poland, June 17-22, 2018.

*Duque, C**, **HA Michael**, The subterranean estuary: Descriptive term or confusing jargon?, 25th Salt Water Intrusion Meeting, Gdansk, Poland, June 17-22, 2018.

*Duque, C**, S Jenssen, TW Brooks, *CJ Russoniello*, P Engesgaard, **HA Michael**, Hydrogeological flow paths in coastal areas: A dismissed factor for the delivery of nutrients?, 25th Salt Water Intrusion Meeting, Gdansk, Poland, June 17-22, 2018.

Kiro, Y*, **HA Michael**, *C Duque*, Y Yechieli, Estimating the potential role of long-term seawater circulation in aquifers in ocean chemistry, European Geophysical Union Meeting, Vienna, Austria, April 8-13, 2018.

2017 *Guimond, J**, A Seyfferth, **HA Michael**, Hydrologically mediated iron reduction/oxidation fluctuations and dissolved organic carbon exports in tidal wetlands, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

*Geng, X**, *P Kreyns*, *M Koneshloo*, **HA Michael**, Impacts of preferential flow on coastal groundwater-surface water interactions: The heterogeneous volcanic aquifer of Hawaii, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

*Kim, KH**, **HA Michael**, W-J Cai, WJ Ullman, Spatial distributions of biogeochemical reactions in freshwater-saltwater mixing zones of sandy beach aquifers, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

Harvey, CF*, **HA Michael**, What drives saline circulation cells in coastal aquifers? An energy balance for density-driven groundwater systems, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

*Tan, F**, K Yoo, P Imhoff, **HA Michael**, The impact of organo-mineral complexation on mineral weathering in the soil zone under unsaturated conditions, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

*Russoniello, CJ**, *JW Heiss*, **HA Michael**, Variability in benthic exchange rate, depth, and residence time beneath a shallow coastal estuary, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

*Yu, X**, **HA Michael**, Impact of heterogeneity on groundwater salinization due to coastal pumping, American Geophysical Union Fall Meeting, New Orleans, LA, December 11-15, 2017.

*Guimond, J**, **HA Michael**, Spatial and temporal impacts of crab burrows on groundwater-surface water interactions and redox conditions in a tidal wetland, Geological Society of America Annual Meeting, Seattle, WA, October 22-25, 2017.

*Kim, KH**, **HA Michael**, W-J Cai, WJ Ullman, Dynamic migration of biogeochemical reaction zones in an intertidal beach aquifer, Geological Society of America Annual Meeting, Seattle, WA, October 22-25, 2017.

*Russoniello, CJ**, **HA Michael**, Spatial and temporal variability of global wave pumping, Geological Society of America Annual Meeting, Seattle, WA, October 22-25, 2017.

Kiro, Y*, **HA Michael**, *C Duque*, Y Yechieli, Identifying long-term seawater circulation in coastal aquifers and its potential role in ocean chemistry, Geological Society of America Annual Meeting, Seattle, WA, October 22-25, 2017.

Field, EK*, KL Hoppes, *KH Kim*, **HA Michael**, TE Hanson, CS Chan, The microbial role in nutrient cycling in a dynamic coastal aquifer system, Goldschmidt Conference, Paris, France, August 13-18, 2017.

2016 *Guimond, J**, *X Yu*, *C Duque*, *C Medlock*, *S Gangrade*, **HA Michael**, Spatial patterns in salt marsh porewater dissolved organic matter over a spring-neap tidal cycle: insight to the impact of hydrodynamics on lateral carbon fluxes, American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16, 2016.

Stuckey, J*, JJ LeMonte, *X Yu*, M Schaefer, BD Kocar, SG Benner, J Rinklebe, R Tappero, **HA Michael**, SE Fendorf, DL Sparks, **HA Michael**, Hydrologically Controlled Arsenic Release in Deltaic Wetlands and Coastal Riparian Zones, American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16, 2016.

Passalacqua, P*, C Paola, **HA Michael**, Linking Delta Surface Patterns and Subsurface Architecture, American Geophysical Union Fall Meeting, San Francisco, CA, December 12-16, 2016.

*Yu, X**, JJ LeMonte, DL Sparks, JG Cargill, *CJ Russoniello*, **HA Michael**, Hydrologic control on arsenic cycling due to tidal fluctuation, American Chemical Society, Philadelphia, PA, August 21-25, 2016.

Field, EK*, KL Hoppes, *KHK Kim*, **HA Michael**, TE Hanson, CS Chan, Just another day at the beach? The microbial role in iron and sulfur cycling in a beach aquifer system, International Society for Microbial Ecology, Montreal, CA, August 21-26, 2016.

*Duque, C**, *CJ Russoniello*, *TW Brooks*, **HA Michael**, Spatial variability of submarine groundwater discharge: Field experiments and numerical modelling, CUAHSI Biennial Meeting, Shepherdstown, WV, July 24-27, 2016.

*Medlock, C**, *J Guimond*, **HA Michael**, *S Gengrade*, Assessing spatial variations in pore water salinity across a tidal salt marsh: Insights into groundwater-surface water interactions, CUAHSI Biennial Meeting, Shepherdstown, WV, July 24-27, 2016.

*Kim, KHK**, **HA Michael**, WJ Ullman, Spatial patterns of aerobic respiration in an intertidal beach aquifer, CUAHSI Biennial Meeting, Shepherdstown, WV, July 24-27, 2016.

*Yu, X**, **HA Michael**, Big data and models for coastal communities, CUAHSI Biennial Meeting, Shepherdstown, WV, July 24-27, 2016.

*Brown, R**, *C Duque*, *CJ Russoniello*, M Sherif, UA Risha, K Knee, NC Sturchio, **HA Michael**, Assessing methods for studying submarine groundwater discharge: pre-filling of bags in seepage meters, tidal impact over measured fluxes, and use of radon, CUAHSI Biennial Meeting, Shepherdstown, WV, July 24-27, 2016.

2015 *Khan, MR**, **HA Michael**, Vulnerability of deep groundwater in the Bengal Basin to contamination: the role of physical and chemical aquifer heterogeneity and pumping, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015.

Shuai, P, A Hossain, K Rhodes, PSK. Knappett, N Dimova, MB Cardenas, KM Ahmed, **HA Michael**, R Mozumder, A van Geen, Modeling arsenic mobilization in a riverbank aquifer under the influence of tidally fluctuating river and irrigation pumping, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015.

*Heiss, JW**, JA Puleo, WJ Ullman, **HA Michael**, Temporal and spatial variability of sediment saturation and patterns of groundwater-surface water exchange in the intertidal zone at swash and tidal time scales, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015.

*Yu, X**, J Yang, T Graf, *M Koneshloo*, **HA Michael**, Assessing the impact of topography on groundwater salinization due to storm surge inundation, American Geophysical Union Fall Meeting, San Francisco, CA, December 14-18, 2015.

*Russoniello, CJ**, LF Konikow, **HA Michael**, Estimating groundwater transit times through a coastal aquifer using MODPATH, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

*Yu, X**, JJ LeMonte, DL Sparks, JG Cargill, **HA Michael**, Potential impacts of sea-level rise on contaminant mobility and groundwater pollution, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

*Heiss, JW**, **HA Michael**, The effects of transient oceanic and terrestrial forcing and beach topography on flow and solute transport in coastal aquifers, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

*Koneshloo, M**, *KC Scott*, **HA Michael**, Which connectivity metrics can be used to predict salinity patterns in heterogeneous coastal aquifers?, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

*Kim, KH**, **HA Michael**, WJ Ullman, Sediment and porewater oxygen demand in a sandy beach aquifer, Cape Henlopen, Delaware, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

*Khan, MR**, B Nath, B Huhmann, I Choudhury, M Chakraborty, A Mukherjee, KM Ahmed, CF Harvey, A van Geen, **HA Michael**, Origin of arsenic-rich, young groundwater in deep tubewells in the central southwestern Bengal Basin, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

Nath, B*, *MR Khan*, B Huhmann, I Choudhury, T Ellis, M Chakraborty, A Mukherjee, KM Ahmed, **HA Michael**, CF Harvey, B Bostick, B Mailloux, P Schlosser, A van Geen, Groundwater chemistry of deep (>300 feet) high-As aquifers across the India-Bangladesh border, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

Hoppes, K*, CS Chan, K Cabaniss, KH Williams, M Moore, **HA Michael**, J Caplan, Microbial iron oxidation and contribution to Fe oxide coatings in aquifer sediment, Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

A van Geen*, *MR Khan*, B Nath, B Huhmann, I Choudhury, M Chakraborty, C Harvey, **H Michael**, B Bostick, B Mailloux, P Schlosser, A Mukherjee, KM Ahmed, Young high-arsenic groundwater confirmed to 250 m depth across the India-Bangladesh border, Goldschmidt Conference, Prague, Czech Republic, August 16-21, 2015.

Duke, J, Z Liu*, KD Messer, **H Michael**, J Suter, Optimal taxes and welfare in a spatially explicit aquifer: Experimental evidence, NAREA & CAES Joint Annual Meeting and Workshop, Newport, RI, June 27-30, 2015.

Graf, T*, **H Michael**, I Neuweiler, A Peche, T Ptak, J Yang, *X Yu*, M Walther, Integrated hydrosystem modeling of coastal and urban areas, Integrated Hydrosystem Modeling 2015 Conference, Tubingen, Germany, April 7-10, 2015.

2014 *Tan, F**, *E Lunn*, B Fisher, K Yoo, PT Imhoff, **HA Michael**, The evolution of soil hydrological and physical properties under the impact of mineral weathering and organic matter sequestration, American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2014.

*Calhoun, KC**, *M Koneshloo*, **HA Michael**, Effects of the geometry of heterogeneous hydraulic conductivity fields on aquifer-ocean exchange processes, Geological Society of America Annual Meeting, Vancouver, BC, Canada, October 19-22, 2014.

*Khan, MR**, *M Koneshloo*, PK Knappett, MRH Mozumder, B Mailloux, KM Ahmed, BC Bostick, CF Harvey, A van Geen, **HA Michael**, Effect of aquifer heterogeneity on the sustainability of deep groundwater resources in the Bengal Delta near a mega-city pumping center, Geological Society of America Annual Meeting, Vancouver, BC, Canada, October 19-22, 2014.

*Kim, KHK**, **HA Michael**, WJ Ullman, Relationship between the physical and biogeochemical dynamics in the shallow freshwater-saltwater mixing zone of an intertidal beach aquifer (Cape Henlopen, Delaware), Geological Society of America Annual Meeting, Vancouver, BC, Canada, October 19-22, 2014.

Knappett, PSK*, SH Akhter, I Choudhury, M Steckler, **HA Michael**, CF Harvey, KM Ahmed, BC Bostick, M Shamsudduha, A van Geen, Impact of over-pumping from deep aquifer in Dhaka City on the safe water supply for surrounding rural population, Geological Society of America Annual Meeting, Vancouver, BC, Canada, October 19-22, 2014.

Michael, HA*, L Feinson, CI Voss, *CJ Russoniello, L Byron, MR Khan, K Calhoun, M Koneshloo*, Vulnerability of groundwater to salinization: the case of the Bengal Delta, Deltas in Times of Climate Change II, Rotterdam, The Netherlands, September 24-26, 2014.

Sawyer, AH, K Kroeger, *O Lazareva, K Crespo*, CS Chan, T Stieglitz, **HA Michael***, Geologic and hydrodynamic effects on shallow groundwater-surface water exchange and chemical fluxes to an estuary, CUAHSI Biennial Meeting, Shepherdstown, WV, July 28-30, 2014.

*Sawyer, AH**, LA Kaplan, *O Lazareva*, **HA Michael**, Insights into hydrogeochemical dynamics in a floodplain aquifer during Hurricane Sandy from multiple sensor technologies, CUAHSI Biennial Meeting, Shepherdstown, WV, July 28-30, 2014.

*Lunn, E**, *F Tan*, P Imhoff, **HA Michael**, Impact of mineral weathering and organic matter on soil water retention, CUAHSI Biennial Meeting, Shepherdstown, WV, July 28-30, 2014.

Suter, J*, S Collie, J Duke, K Messer, **HA Michael**, Experiments on groundwater policy at the extensive and intensive margins, WAEA Annual Meeting, Colorado Springs, CO, June 23, 2014.

Chan, CS*, K Cabaniss, K Williams, M Moore, **HA Michael**, J Caplan, C Lin, Fe-oxidizing microorganisms in microscopic model aquifer systems: feedbacks between flow and biomineralization, ISSM, Pacific Grove, CA, October 5-10, 2014.

Sawyer, AH, **HA Michael***, K Kroeger, *O Lazareva, K Crespo, C Russoniello*, F Shi, J Kirby, CS Chan, T Stieglitz, Geologic and hydrodynamic effects on shallow groundwater-surface water exchange and chemical fluxes to an estuary, 23rd Salt Water Intrusion Meeting, Husum, Germany, June 16-20, 2014.

*Heiss, JW**, **HA Michael**, Tidal, spring-neap, and seasonal dynamics of a saltwater-freshwater mixing zone in a beach aquifer, 23rd Salt Water Intrusion Meeting, Husum, Germany, June 16-20, 2014.

Michael, HA*, *AH Sawyer*, KD Kroeger, *CJ Russoniello*, LF Konikow, Stratigraphic controls on submarine groundwater discharge, groundwater-surface water mixing, and associated chemical fluxes to an estuary, Ocean Sciences Meeting, Honolulu, HI, February 25, 2014.

*McAllister, SM**, JM Barnett, GW Luther III, **HA Michael**, CS Chan, Interplay between iron- and sulfur- cycling microbial communities and geochemistry along ecosystem gradients in the intertidal mixing zone of a beach aquifer Ocean Sciences Meeting, Honolulu, HI, February 25, 2014.

2013 Michael, HA*, KD Kroeger, *C Fernandez*, LF Konikow, *AH Sawyer, CJ Russoniello*, JF Bratton, Impact of Groundwater Flowpaths on Subsurface Denitrification and Nutrient Loading to an Estuary, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2013.

*Sawyer, AH**, LA Kaplan, *O Lazareva*, **HA Michael**, Storm-associated hydrodynamics drive transient solute and redox chemistry within the floodplain aquifer and hyporheic zone of a piedmont stream, American Geophysical Union Fall Meeting, San Francisco, CA, December 9-13, 2013.

Li, J., J Duke, HA Michael, K Messer, D Sparks, The Joint Risks of Anticipated Sea Level Rise and Coastal Contaminated Sites: Economic and Scientific Evidence, The Northeast Agricultural and Resource Economics Association (NAREA) Annual Meeting, Ithaca, NY, June 23-25, 2013.

Li, J., HA Michael, J Duke, K Messer, J Suter, Impact of Risk Information in a Spatially Explicit Groundwater Environment with Contamination Risk: Experimental Evidence, The Northeast Agricultural and Resource Economics Association (NAREA) Annual Meeting, Ithaca, NY, June 23-25, 2013.

Knappett, PS, BJ Mailloux, I Choudhury, S Barua, DR Mondal, M Steckler, H Akter, KM Ahmed, B Bostick, HA Michael, C Harvey, A van Geen, Investigating sources and sinks for water in deep aquifers in Bangladesh, , National Ground Water Association Ground Water Summit, San Antonio, Texas, April 28-May 2, 2013.*

Andres, AS, HA Michael, J Madsen, C Russoniello, C Fernandez, J Bratton, V Cross, Integration of multiple geophysical techniques to image a submarine groundwater discharge zone, National Ground Water Association Ground Water Summit, San Antonio, Texas, April 28-May 2, 2013.*

2012 *Konikow, LF*, M Akhavan, AH Sawyer, HA Michael, CD Langevin, Bathymetry-density interaction as a driver for seawater recirculation in submarine groundwater discharge, American Geophysical Union Fall Meeting, San Francisco, CA, December 7, 2012.*

Russoniello, CJ, M Kereszi, HA Michael, Exploring wave-induced artifacts and asymmetry in seepage meter measurements, Geological Society of America Annual Meeting, Charlotte, NC, November 4-7, 2012.*

Khan, Md MR, HA Michael, CI Voss, Water resources management in the Ganges Basin: A comparison of three strategies for conjunctive use of groundwater and surface water, Geological Society of America Annual Meeting, Charlotte, NC, November 4-7, 2012.*

Heiss, JW, AH Sawyer, WJ Ullman, HA Michael, Seasonal water table effects on tide-induced saltwater-freshwater mixing in sandy beaches, Geological Society of America Annual Meeting, Charlotte, NC, November 4-7, 2012.*

Sawyer, AH, O Lazareva, K Crespo, HA Michael, Shallow stratigraphic controls on surface water-groundwater mixing and geochemical fate in the benthic zone of an estuary, Geological Society of America Annual Meeting, Charlotte, NC, November 4-7, 2012.*

JF Bratton, KD Kroeger, SA Ruberg, HA Michael, DE Krantz, Comparison of methods and results in recent studies of direct groundwater discharge to the Atlantic coast and Great Lakes, Goldschmidt Conference, Montreal, Canada, June 24-29, 2012.*

Michael, HA*, *CJ Russoniello, C Fernandez, LF Konikow, AS Andres, JF Bratton, JF Banaszak, DE Krantz, Geologic effects on subsurface salinity distributions, groundwater flowpaths, and aquifer-estuary exchange in Indian River Bay, Delaware, USA, 22nd Salt Water Intrusion Meeting, Buzios, Brazil, June 17-22, 2012.*

Liu, Z, J Suter, K Messer, J Duke, HA Michael, Spatial Externalities and Strategic Behavior in Accessing Groundwater Resource: Evidence from the Lab, Northeastern Agricultural and Resource Economics Association meeting, Lowell, MA, June 10-12, 2012.*

Kroeger, KD, C Fernandez, CJ Russoniello, AS Andres, JF Bratton, JK Bohlke, L Konikow, HA Michael, Denitrification and nitrogen loading at the aquifer/estuary interface: The role of coastal*

hydrology and implications for management of nitrogen loads, American Society of Limnology and Oceanography Annual Meeting, Salt Lake City, UT, February 20-24, 2012.

2011 *Heiss, J**, WJ Ullman, and **HA Michael**, Swash-Induced Infiltration in a Sandy Beach Aquifer, Cape Henlopen, Delaware, American Geophysical Union Fall Meeting, San Francisco, CA, December 4-9, 2011.

*Russoniello, CJ**, *C Fernandez*, JF Bratton, D Krantz, J Banaszak, AS Andres, LF Konikow, and **HA Michael**, Control of submarine groundwater discharge patterns and salinity by a low-permeability paleochannel cap at Indian River Bay, Delaware, American Geophysical Union Fall Meeting, San Francisco, CA, December 4-9, 2011.

Michael, HA*, CI Voss, KA Radloff, and Y Zheng, Multi-scale modeling of physical and chemical effects on arsenic transport to deep wells in the Bengal Basin, Conference on Arsenic in Groundwater in Southern Asia, Hanoi, Vietnam, November 14-17, 2011.

Radloff, KA*, Y Zheng, **HA Michael**, M Stute, KM Ahmed, A van Geen, Arsenic adsorption influences safe drinking water options in Bangladesh, Society of Environmental Toxicology and Chemistry Annual Meeting, Boston, MA, November 13-17, 2011.

Konikow, LF*, *M Akhavan*, **HA Michael**, and C Langevin, Coastal recirculation of saltwater due to coupled effect of variable bathymetry and density, Geological Society of America Annual Meeting, Minneapolis, MN, 9-12 October, 2011.

Michael, HA*, *C Fernandez*, *CJ Russoniello*, AS Andres, KD Kroeger, DE Krantz, JF Banaszak, A Musetto, K Myers, LF Konikow, and JF Bratton, Geologic and Hydrologic Control of Porewater Chemistry and Submarine Groundwater Discharge into Indian River Bay, Delaware, Goldschmidt Conference, August 14-19, 2011, Prague, Czech Republic.

Suter, J*, **HA Michael**, K Messer, and J Duke, An Experimental Investigation of Groundwater Resource Dynamics, Agricultural & Applied Economics Association & Northeastern Agricultural and Resource Economics Association Joint Annual Meeting, Pittsburgh, PA, July 24-26, 2011.

Suter, J*, **HA Michael**, KD Messer, JM Duke, An Experimental Investigation of Groundwater Resource Dynamics, International Water Resource Economics Consortium Conference, Banff, Canada, June 2011.

Michael, HA*, *CJ Russoniello*, *C Fernandez*, *A Musetto*, *K Myers*, JF Bratton, AS Andres, DE Krantz, JF Banaszak, KD Kroeger, and LF Konikow, Spatial patterns in subsurface salinity and submarine groundwater discharge into Indian River Bay, Delaware, National Ground Water Association Ground Water Summit, Baltimore, MD, May 1-5, 2011.

*Fernandez, C**, KD Kroeger, JF Bratton, *CJ Russoniello*, *A Musetto*, AS Andres, and **HA Michael**, Porewater Salinity Distribution and Geochemical Characterization of the Subsurface of Indian River Bay, Delaware, National Ground Water Association Ground Water Summit, Baltimore, MD, May 1-5, 2011.

*Russoniello, CJ**, **HA Michael**, AS Andres, and LF Konikow, Construction of a watershed-scale model towards an understanding large-scale influences on submarine groundwater discharge to the Inland Bays Watershed, Sussex Co., Delaware, National Ground Water Association Ground Water Summit, Baltimore, MD, May 1-5, 2011. *Won NGWA Farvolden Award for best student presentation.*

Andres, AS*, PS McCreary, *CJ Russoniello, C Fernandez, K Myers, A Musetto*, and **HA Michael**, Case study of use of offshore wells for monitoring submarine groundwater discharge, Indian River Bay, Delaware, National Ground Water Association Ground Water Summit, Baltimore, MD, May 1-5, 2011.

*Heiss, JW**, **HA Michael**, and WJ Ullman, Characterization of Fluid Flow and Seawater Infiltration through the Beachface Saltwater/Freshwater Mixing Zone, National Ground Water Association Ground Water Summit, Baltimore, MD, May 1-5, 2011.

- 2010** Voss, CI*, **HA Michael**, and P Aggarwal, Simply-structured groundwater model analysis for informing management of Transboundary aquifers: Examples from Bengal Aquifer System (Bangladesh, India) and Nubian Sandstone Aquifer System (Chad, Egypt, Libya, Sudan), International Conference “Transboundary Aquifers: Challenges and New Directions” (ISARM 2010), December 6-8, 2010.

Michael, HA*, LS Feinson, *L Byron*, and CI Voss, Climate and human impacts on the vulnerability of coastal groundwater resources to salinization by seawater, Sixth International Conference on Sustainable Water Environment, “Water Infrastructures in Time of Climate Change”, Newark, DE, July 29-31, 2010.

Michael, HA*, LS Feinson, and CI Voss, Mechanisms of seawater intrusion in Bangladesh and the potential impacts of sea-level rise on coastal groundwater resources, 21st Salt Water Intrusion Meeting, Azores, Portugal, June 21-26, 2010.

Michael HA*, CI Voss, KA Radloff, and Y Zheng, Regional modeling of groundwater flow and arsenic transport in the Bengal Basin: Effects of sorption on safe groundwater use, Goldschmidt Conference on Earth, Energy, and the Environment, June 13-18, 2010, Knoxville, TN.

Radloff, KA*, Y Zheng, **HA Michael**, M Stute, I Mihajlov, and KM Ahmed, Evaluating arsenic adsorption in a low arsenic aquifer in Bangladesh using *in situ* and laboratory methods, Goldschmidt Conference on Earth, Energy, and the Environment, June 13-18, 2010, Knoxville, TN.

Michael, HA*, MA Charette, and CF Harvey, Mechanisms Driving Submarine Groundwater Discharge and Associated Radium Flux, 3rd Radium-Radon Meeting, March 15-18, 2010, Jerusalem, Israel.

- 2009 Michael, HA***, Investigating Fluxes between Aquifers and the Sea on Multiple Spatial and Temporal Scales through Modeling, International Conference on Aquatic Resources, Nov 20, 2009, Alexandria, Egypt.

Bratton, J*, J Crusius, K Kroeger, JK Bohlke, D Krantz, **H Michael**, S Baldwin, and A Green, Coastal groundwater discharge from both sides of the Delmarva Peninsula, Atlantic Estuarine Research Society Meeting, 5-7 March 2009, Ocean City, MD.

- 2008 Michael, HA***, H Li, T Li, A Boucher, SM Gorelick, and J Caers, Combining methods for geologically-realistic reservoir simulation, Eighth International Geostatistics Congress, December 2008, Santiago, Chile.

Michael, HA*, MA Charette, and CF Harvey, Mechanisms Driving Submarine Groundwater Discharge and Associated Radium Flux: Implications for Use of Radium as a Tracer, 20th Salt Water Intrusion Meeting, Naples, FL June 23-27, 2008.

Michael, HA and CI Voss*, Hydrogeologic Analysis and Evaluation of Sustainable Management Alternatives in the Bengal Basin Aquifer System in the Face of Data Sparsity, National Ground Water Association Ground Water Summit, Memphis, TN, April 2, 2008.

2007 Michael, HA and CI Voss*, Modelling evaluation of sustainable management alternatives in the high-Arsenic region of the Bengal Delta Aquifer (India and Bangladesh), MODEL CARE 2007, Copenhagen, Denmark, September 9-13, 2007.

2006 Michael, HA and CI Voss*, Transboundary hydrogeologic analysis of the Bengal Delta aquifer of India and Bangladesh, International Association of Hydrogeologists (IAH) 34th Congress, Beijing, China, October 2006.

Michael, HA*, AE Mulligan, and CF Harvey, Saline water exchange between aquifers and the coastal ocean driven by the seasonal hydrologic cycle, First International Joint Salt Water Intrusion Meeting, Cagliari, Italy, September 24-29, 2006.

Michael, HA and CI Voss*, Hydrogeologic analysis of the Bengal Delta aquifer of India and Bangladesh, IAH Symposium, “Aquifer Systems Management”, Dijon, France, May 30 – June 1, 2006

2005 Michael, HA*, AE Mulligan, and CF Harvey, The seasonal hydrologic cycle: A driver of saline water exchange between aquifers and the coastal ocean, Geological Society of America Annual Meeting, Salt Lake City, UT, October 16-19, 2005.

Michael, HA* and CI Voss*, Hydrogeologic analysis of the Bengal Delta: Numerical modeling of groundwater flow, Symposium on Behavior of Arsenic in Aquifers, Soils and Plants: Implications for Management, Dhaka, Bangladesh, January 16-18, 2005.

2001 Michael, HA*, MA Charette, JS Lubetsky, and CF Harvey, Assessing rates and mechanisms of submarine groundwater discharge: A combined approach using seepage meters and radium isotopes, American Geophysical Union Spring Meeting, Boston, MA, May 29, 2001.

2000 Michael, HA*, JS Lubetsky, and CF Harvey, Groundwater discharge into Waquoit Bay on Cape Cod, American Geophysical Union Fall Meeting, San Francisco, CA, December 19, 2000.

INVITED PRESENTATIONS to Universities and Organizations

*presenting author

2024 Michael, HA*, Hydrological, biological, and geochemical linkages in coastal wetlands and their response to climate change, *University of Maryland*, May 3, 2024.

2023 Michael, HA*, The coastal squeeze: drivers and impacts of salinization at the land-sea interface, CINet Junior Scientist Council Pop-up Webinar Series, November 17, 2023.

Michael, HA*, Drivers and impacts of marsh migration in the coastal critical zone, *IDEAS Watersheds Project (DoE)*, September 26, 2023.

2022 Michael, HA*, The coastal squeeze: Drivers and impacts of salinization at the land-sea interface, *Boston University*, November 29, 2022.

Michael, HA*, Climate, population, and the coastal groundwater squeeze, *McGill University*, November 17, 2022.

Michael, HA*, Drivers and impacts of marsh migration in the coastal critical zone, *University of Maryland Baltimore County*, November 2, 2022.

Michael, HA*, Hydrological, biological, and geochemical linkages in coastal wetlands and their response to climate change, *Horn Point Laboratory*, October 19, 2022.

Michael, HA*, Is offshore fresh groundwater a resource for the future? Exploring hydrogeologic connections through the continental shelf, *University of Colorado Boulder*, March 9, 2022.

Michael, HA*, Climate and sea level impacts on groundwater vulnerability to salinization from the surface and subsurface: A quick overview of ongoing projects, *USGS NGWOS Webinar*, February 17, 2022.

2021 Michael, HA*, Is offshore fresh groundwater a resource for the future? Exploring hydrogeologic connections through the continental shelf, *Massachusetts Institute of Technology*, March 26, 2021.

Michael, HA*, Insights from geostatistical applications in heterogeneous coastal groundwater systems from the beach to the continental shelf, *Stanford University*, February 23, 2021.

Michael, HA*, Connectivity of coastal aquifers, submarine groundwater discharge, and offshore freshened groundwater, *Land-Ocean Connectivity of Groundwater Workshop*, Kiel, Germany, February 16, 2021.

2020 Michael, HA*, Hydrological, biological, and geochemical linkages in coastal wetlands and their response to sea-level rise, *Hebrew University*, November 18, 2020.

2019 Michael, HA*, Vulnerability of groundwater resources in Bangladesh: intersection of dense populations, geologic complexity, and large-scale arsenic contamination, *Temple University*, September 27, 2019.

Michael, HA*, Global in-situ data needs to advance groundwater resource analysis, *National Academy of Sciences Workshop on Groundwater Recharge and Flow*, Washington, DC, June 27-28, 2019. (Keynote)

Michael, HA*, The influence of geologic heterogeneity on large-scale groundwater flow and solute transport: Continental shelves and mega-cities, *University of Massachusetts, Amherst*, April 6, 2019.

Michael, HA*, Climate, Population, and the Squeeze on Coastal Groundwater, *University of Tennessee*, March 14, 2019.

2018 Michael, HA*, Climate, Population, and the Squeeze on Coastal Groundwater, *Aarhus University*, Denmark, December 4, 2018.

Michael, HA*, Challenges in characterizing submarine groundwater discharge across scales, *University College London*, November 28, 2018.

Michael, HA*, Challenges in characterizing submarine groundwater discharge across scales, *Universitat Politècnica de Catalunya*, Barcelona, Spain, November 20, 2018.

Michael, HA*, Challenges in characterizing submarine groundwater discharge across scales, *Oldenburg University*, Oldenburg, Germany, November 17, 2018.

Michael, HA*, Vulnerability of groundwater resources in Bangladesh: Dense populations, geologic complexity, and large-scale arsenic contamination, *Federal Institute for Geosciences and Natural Resources (BGR) and Leibniz University*, Hannover, Germany, November 14, 2018.

Michael, HA*, Climate, Population, and the Squeeze on Coastal Groundwater, *Deltares and University of Utrecht*, Utrecht, The Netherlands, November 12, 2018.

Michael, HA*, Climate, Population, and the Squeeze on Coastal Groundwater, *Hong Kong University*, October 26, 2018.

Michael, HA*, Climate, Population, and the Squeeze on Coastal Groundwater, *Sun Yat-sen University*, Guangzhou, China, October 25, 2018.

Michael, HA*, Challenges in characterizing submarine groundwater discharge across scales, *Southern University of Science and Technology*, Shenzhen, China, October 23, 2018.

Michael, HA*, Climate, Population, and the Squeeze on Coastal Groundwater, *Southern University of Science and Technology*, Shenzhen, China, October 23, 2018.

Michael, HA*, Vulnerability of groundwater resources in Bangladesh: Dense populations, geologic complexity, and large-scale arsenic contamination, *Westlake Distinguished Lecture*, Westlake University, October 22, 2018.

Michael, HA*, Challenges in characterizing submarine groundwater discharge across scales, *Seoul National University*, October 16, 2018.

2017 Michael, HA*, Land-Sea Water Exchange from Ripples to Shelves: Implications for Chemical Inputs to the Coastal Ocean, *Woods Hole Oceanographic Institution*, May 24, 2017.

Michael, HA*, Land-sea water exchange from ripples to shelves: Exploring physical-biogeochemical linkages, *University of Minnesota*, May 5, 2017.

Michael, HA*, The influence of geologic heterogeneity on large-scale groundwater flow and solute transport: Mega-cities and continental shelves, *University of Minnesota*, May 4, 2017.

Michael, HA*, Vulnerability of groundwater resources in Bangladesh: Interplay between dense populations, geologic complexity, and large-scale arsenic contamination, *K. Douglas Nelson Colloquium Series*, *Syracuse University*, April 27, 2017.

Michael, HA*, Land-sea water exchange from ripples to shelves: Exploring physical-biogeochemical linkages, School of Earth, Ocean and Environment, *University of South Carolina*, April 13, 2017.

Michael, HA*, The influence of geologic heterogeneity on large-scale groundwater flow and solute transport: Mega-cities and continental shelves, Center for Environmental & Applied Fluid Mechanics, *Johns Hopkins University*, April 7, 2017.

Michael, HA*, The influence of geologic heterogeneity on large-scale groundwater flow and solute transport: Continental shelves and mega-cities, *University of Hawaii*, Honolulu, HI, February 24, 2017.

2016 Michael, HA*, Land-Sea Water Exchange from Ripples to Shelves: Implications for Coastal Ecosystems and Ocean Chemistry, *Lamont-Doherty Earth Observatory*, *Columbia University*, New York, NY, October 21, 2016.

Michael, HA*, Linking Hydrology, Geology, and Engineering toward Sustainable Solutions to Widespread Arsenic Contamination in the Bengal Delta, Challenges and Innovation in Civil and

Environmental Engineering and Earth Sciences Seminar Series, *University of Notre Dame*, Notre Dame, IN, September 15, 2016.

Michael, HA*, Vulnerability of groundwater resources in Bangladesh: The interplay between dense populations, geologic complexity, and large-scale arsenic contamination, Weston Roundtable on Sustainability, *University of Wisconsin*, Madison, WI, April 21, 2016.

Michael, HA*, Land-Sea Water Exchange from Ripples to Shelves: Implications for Groundwater Management and Chemical Inputs to the Coastal Ocean, Weeks Lecture, Department of Geoscience, *University of Wisconsin*, Madison, WI, April 22, 2016.

Michael, HA*, The Role of Preferential Flow in Large-Scale Groundwater Systems: Arsenic and Salinity in the Bengal Delta, *University of Maryland Baltimore County*, Baltimore, MD, April 1, 2016.

Michael, HA*, Transport of Solutes through Heterogeneous Delta Sediments: Implications for Groundwater Resources in Bangladesh, *Vanderbilt University*, Nashville, TN, January 22, 2016.

2015 Michael, HA*, Intertidal groundwater-surface water exchange in Delaware, *New Jersey Institute of Technology*, Newark, NJ, December 11, 2015.

Michael, HA*, Geologic effects on land-sea water and solute exchange across scales: examples from Delaware and Bangladesh, *USGS MD-DE-DC Water Science Center*, Baltimore, MD, November 20, 2015.

Michael, HA*, Land-Sea Water Exchange across Scales: from Muck to Models, *Pennsylvania State University*, Department of Geosciences, State College, PA, November 17, 2015.

Michael, HA*, Land-Sea Water Exchange across Scales: from Muck to Models, *University of North Carolina*, Curriculum for the Environment and Ecology and Department of Geology, Chapel Hill, NC, September 24, 2015.

Michael, HA*, Transport of solutes through hydraulically and chemically heterogeneous sediments of the Bengal Basin, *CSIRO Land and Water*, Floreat, Australia, May 12, 2015.

Michael, HA*, Land-sea water exchange: Implications for groundwater management and chemical inputs to the coastal ocean, *CSIRO Land and Water*, Floreat, Australia, May 11, 2015.

Michael, HA*, Land-Sea Water Exchange across Scales: Examples from Delaware, USA, *University of Queensland*, St. Lucia, Australia, April 28, 2015.

Michael, HA*, The Influence of Hydrologic, Geologic, and Geochemical Interactions on Solute Fluxes to the Sea: Examples from the Atlantic Coast, USA, *Southern Cross University*, Coffs Harbour, Australia, April 23, 2015.

Michael, HA*, Coastal groundwater-surface water interactions: methods and applications in Delaware, USA, *National Centre for Groundwater Research and Training*, Adelaide, Australia, February 13, 2015.

Michael, HA*, Land-sea water exchange from ripples to shelves, *CSIRO Land and Water*, Adelaide, Australia, January 23, 2015.

2014 Michael, HA*, Land-sea water exchange: Implications for groundwater management and chemical inputs to the coastal ocean, *Simon Fraser University*, Vancouver, Canada, October 28, 2014.

Michael, HA*, *JW Heiss**, Impacts of sea-level rise on groundwater salinity and beach aquifer mixing dynamics, *Institute of Fluid Mechanics and Environmental Physics in Civil Engineering, Leibniz University*, Hannover, Germany, June 24, 2014.

Michael, HA*, DL Sparks, K Messer, V Perez, T Powers, The effect of sea-level rise on contaminant mobility and cycling, *Delaware National Estuarine Research Reserve Research Symposium*, Dover, DE, March 21, 2014.

2013 Michael, HA*, Salty water and rising seas: Groundwater salinization mechanisms and vulnerability, *University of Delaware Physical Ocean Sciences and Engineering Seminar*, Newark, DE, March 1, 2013.

2012 Michael, HA*, In search of a mitigation strategy for groundwater arsenic in the Bengal Basin: Are deep aquifers the solution?, *West Chester University*, West Chester, PA, October 31, 2012.

Michael, HA*, *CJ Russoniello, C Fernandez, A Musetto, K Myers, D Knights*, AS Andres, K Kroeger, LF Konikow, DE Krantz, J Banaszak, J Bratton, Hydrologic, geologic, and geochemical effects on nutrient fluxes to Indian River Bay: Evidence from measurements at Holts Landing State Park, *Delaware Center for the Inland Bays Scientific and Technical Advisory Committee Meeting*, Lewes, DE, September 2012.

*Khan, MMR, HA Michael**, and CI Voss, The Ganges Water Machine: How using groundwater can reduce monsoon flood risks, *The World Bank*, Washington, DC, April 24, 2012.

Michael, HA*, What controls groundwater nutrient fluxes to bays? A hydrogeological and geophysical study in Indian River Bay, Delaware, *University of Maryland Horn Point Laboratory*, February 1, 2012.

2011 Michael, HA*, Irrigation effects on hydrogeology and groundwater sustainability in the Bengal Basin, Columbia University Earth Institute series on Sustainable Development, seminar and panelist for discussion on Water Management in Agriculture, *Columbia University*, New York, NY, November 30, 2011.

Michael, HA*, Impacts of hydrologic, geologic, and geochemical interactions on fluxes to Indian River Bay, DE, Hydrology Brown Bag Lecture, *University of Texas at Austin*, Austin, TX, October 28, 2011.

Michael, HA*, In search of a mitigation strategy for groundwater arsenic in the Bengal Basin: Are deep aquifers the solution?, *University of Texas at Austin*, Austin, TX, Distinguished Oliver Lecture, October 27, 2011.

Michael, HA*, Hydrologic, geologic, and geochemical interactions at the coast: implications for fluxes into Indian River Bay, Delaware, *Tulane University Department of Earth and Environmental Sciences*, New Orleans, LA, October 11, 2011.

Michael, HA*, Is deep groundwater the solution to the arsenic crisis in the Bengal Basin? Insights from a regional hydrogeologic analysis, *Millersville University Department of Earth Sciences*, Millersville, PA, September 15, 2011.

Michael, HA*, In search of a mitigation strategy for the arsenic crisis in the Bengal Basin: Is deep groundwater the solution?, *Rutgers University Newark*, Department of Earth and Environmental Sciences, Newark, NJ, March 23, 2011.

Michael, HA*, In search of a mitigation strategy for Groundwater Arsenic in the Bengal Basin: Is deep groundwater the solution?, *Pennsylvania State University* Department of Geosciences, State College, PA, March 1, 2011.

2010 Michael, HA*, Is deep groundwater a viable arsenic mitigation option in the Bengal Basin? Management insights from a regional modeling analysis, *Temple University* Department of Civil and Environmental Engineering, Philadelphia, PA, November 12, 2010.

Michael, HA*, Quantifying Fluid and Chemical Exchange between Aquifers and the Ocean, *Delaware Environmental Institute* (DENIN) Inaugural Research Symposium, Newark, DE, April 9, 2010.

2009 Michael, HA* and CI Voss*, Managing Coastal Groundwater Resources of Bangladesh: Impacts of Climate Change and Sea-Level Rise, *World Bank*, Washington, DC, November 24, 2009.

Michael, HA*, Drivers and Implications of Water Exchange between Aquifers and the Ocean, *Temple University* Department of Earth and Environmental Science, Philadelphia, PA, September 18, 2009.

Michael, HA*, Water exchange between aquifers and the coastal ocean: Mechanisms, flowpaths, and implications for chemical fluxes, *University of Delaware* Environmental Engineering Seminar, May 2009.

2008 Michael, HA*, Investigating groundwater discharge into coastal bays: Overview, past research, and potential applications in the Delaware Inland Bays, *Delaware Center for the Inland Bays* Scientific and Technical Advisory Committee Meeting, Lewes, DE, December 2008.

Michael, HA* and CI Voss, In search of clean water: The sustainability of deep groundwater as an arsenic-safe resource in the Bengal Basin, *University of Delaware*, Geography Department Seminar, Newark, DE, September 2008.

Prior to 2008:

US Geological Survey, Menlo Park, CA, May 2007

Massachusetts Institute of Technology, Department of Civil and Environmental Engineering,

Hydrology Seminar, Cambridge, MA, December 2006

Department of Public Health and Engineering, Dhaka, Bangladesh, November 2006

Indian Institute of Social Welfare and Business Management, Calcutta, India, November 2006

US Geological Survey, Reston, VA, October 2006

Columbia University, New York, NY, October 2006

Stanford University, Department of Geological and Environmental Sciences, Hydrogeology Seminar, Stanford, CA, November 2007

US Geological Survey, Fort Lauderdale, FL, May 2006

University of Dhaka, Department of Geology, Dhaka, Bangladesh, September 2005

Indian Institute of Social Welfare and Business Management, Calcutta, India, September 2005

Geological Survey of India, Calcutta, India, January 2005

Department of Public Health and Engineering, Calcutta, India, January 2005

US Geological Survey, Reston, VA, September 2004

MEDIA COVERAGE (Selected)

CBS News, "An American River", featured our work on the NSF Critical Zone Network Project, <https://www.youtube.com/watch?v=0F8FLiHG1sc>, Aired April 20, 2025.

Chow, D, "Salt water creeping up Mississippi could cause health concerns and more", *NBC News*, <https://www.nbcnews.com/science/environment/salt-water-creeping-mississippi-cause-health-concerns-rcna117360>, September 29, 2023.

McDermott, A, "Ghost Forests Haunt the East Coast, Harbingers of Sea-Level Rise", *Proceedings of the National Academies of Sciences*, 120 (38) e2314607120, <https://doi.org/10.1073/pnas.2314607120>, September 13, 2023.

Delaware Public Media *The Green* interview, "USGS Survey of Delaware Bay Area for Water Research", July 15, 2022. <https://www.delawarepublic.org/show/the-green/2022-07-15/usgs-survey-of-delaware-bay-area-for-water-research>

EOS Editor's Highlight, "Arsenic pollution in Bangladesh is catching up with deeper wells", for doi:10.1029/2020WR027178, May 6, 2020.

Geophysical Research Letters Editor's Highlight: MB Cardenas, "Pumping Offshore Groundwater Resources has Consequences on Land" for doi:10.1029/2019GL081910, March 22, 2019.

EOS Research Spotlight: E. Underwood, Sandy beaches are hotbeds of biochemical activity, *Eos*, 98, doi: 10.1029/2017EO087591, November 30, 2017.

International Business Times: "Overpopulation in Dhaka 'will see groundwater contaminated with arsenic within next decade'", <http://www.ibtimes.co.uk/overpopulation-dhaka-will-see-groundwater-contaminated-arsenic-within-next-decade-1583603>, 27 September 2016 (and multiple other international outlets covering Khan et al., *Nature Communications*, 2016).

Delaware News Journal: "Pollution gains prove elusive in Delaware", by M Murray, April 21, 2016. (Coverage of beach work on nitrogen pollution).

EOS Research Spotlight: Betz, E. O. (2015), A new level of understanding for coastal aquifers, *Eos* 96, doi:10.1029/2015EO023175.

EOS Research Spotlight: Kumar, M., L. Ofori, and E. Tretkoff (2010) Realistic models of aquifer conduits, *Eos Trans. AGU* 91, 252, doi:10.1029/EO091i028p00252-05.

The New York Times: "Poisoned Wells: In Asia, Cutting Arsenic Risk in Water Through Well-Drilling Techniques", by DG McNeil, Jr., May 31, 2010. (and multiple other international outlets covering Fendorf et al., *Science*, 2010).

Water Resources Research Editor's Highlight: "Realistic Models of Aquifer Conduits" for DOI:10.1029/2009WR008414.

Research Highlights: "Arsenic Detectives", *Nature*, 453 (19), June 19, 2008.

In This Issue: "Dig deep to avoid arsenic", *Proceedings of the National Academy of Sciences*, 105 (25), June 24, 2008.

Perkins, S (2005) Invisible rivers: fresh water also flows to sea through the ground, *Science News*, 168 (16) 248-249.

TEACHING

University of Delaware			Newark, DE
<i>Course Number</i>	<i>Course Title</i>		<i>Enrollment</i>
S2025	GEOL 630	Advanced Topics in Hydrogeology	5
S2024	GEOL 428/628	Hydrogeology	34/11
S2023	GEOL 630	Advanced Topics in Hydrogeology	6
S2022	GEOL 428/628	Hydrogeology	19/9
S2021	GEOL 630	Advanced Topics in Hydrogeology	5
S2020	GEOL 428/628	Hydrogeology	24/9
S2019	GEOL 630	Hydrogeological Modeling Seminar	5
F2018	GEOL 667	Advanced Topics in Hydrology (online collaboration)	9
S2018	GEOL 428/628	Hydrogeology	18/9
F2017	GEOL 667	Advanced Topics in Hydrology (online collaboration)	3
	CIEG 469	Independent Study	1
S2017	GEOL 630	Groundwater-Surface Water Interactions Seminar	4
	GEOL 203	Earth Surface Processes (with J Pizzuto)	18
F2016	GEOL 603	Groundwater Modeling	5
S2016	GEOL 203	Earth Surface Processes (with J Pizzuto)	19
F2015	GEOL 428/628	Hydrogeology	15/14
S2014	GEOL 203	Earth Surface Processes (with J Pizzuto)	19
F2013	GEOL 667	Classic Papers in Hydrogeology Seminar	7
S2013	GEOL 659/STAT 659	Spatial Statistics (with D Legates)	7
	GEOL 203	Earth Surface Processes (with J Pizzuto)	18
F2012	GEOL 428/628	Hydrogeology	8/4
S2012	GEOL 467/667	Groundwater Modeling	1/4
F2011	GEOL 428/628	Hydrogeology	14/6
S2011	GEOL 667	Mathematical Modeling for Geoscientists (with J Pizzuto)	6
	GEOL 467/667	Coastal Hydrogeology Seminar	1/5
F2010	GEOL 428/628	Hydrogeology	7/5
S2010	GEOL 467/667	Groundwater Modeling	1/6
F2009	GEOL 428/628	Hydrogeology	3/13
S2009	GEOL 428/628	Hydrogeology	9/5

Guest Lectures: FREC 100: Sustainable Development, F2009; F2010
GEOG 320: Water and Society, S2010
CIEG 437: Water Quality, S2017
STAT 659: Spatial Statistics, S2016
ENSC/ENVR 101: Introduction to the Environment, F2023

University of Cagliari	Cagliari, Italy
Practical Modeling of Seawater Intrusion Course, Sept 20-23, 2006	
University of Dhaka, Department of Geology	Dhaka, Bangladesh
MODFLOW Groundwater Modeling Workshop, September 11-15, 2005	
MIT, Department of Civil and Environmental Engineering	Cambridge, MA
Teaching Assistant, Computing and Data Analysis for Environmental Applications, 2001-2003	
MIT, Department of Athletics	Cambridge, MA
Assistant Varsity Women's Lacrosse Coach, 1999-2004	

RESEARCH and GRADUATE ADVISING

Postdoctoral Researchers

- Claudia Zoccarato, 2024-present
- Chieh-Ying (Cindy) Chen, 2024-present
- Anner Paldor, 2019-present
- Rachel Housego, 2021-2023 (now faculty, Pennsylvania State University)
- Chelsea Peters, 2019-2020 (now faculty, Roanoke College)
- Xiaolong Geng, 2017-2019 (now at NOAA)
- Xuan Yu, 2014-2018 (now faculty, Sun Yat-Sen University, China)
- Carlos Duque Calvache, 2015-2017 (now faculty, University of Grenada, Spain)
- Mohammad Koneshloo, 2013-2015 (now at W.D. Von Gonten & Co. Laboratories)
- Jingyuan Li, 2012-2013 (now at City of Toronto, Canada Transportation Division)
- Audrey Sawyer, 2011-2012 (now faculty, Ohio State University)

PhD Students

- Romana Ibrahim, Water Science and Policy, in progress
- Tahmidur Junayed, Earth Sciences, in progress
- Dannielle Pratt, Civil and Environmental Engineering, in progress
- Ryan Frederiks, Earth Sciences, in progress
- Mary Hingst, Water Science and Policy, 2023 (now scientist, Secretariat of the Pacific Community, Fiji)
- Zhongyuan Xu, Water Science and Policy, 2021 (now Assistant Professor, Sichuan University, China)
- Julia Guimond, Earth Sciences, 2020 (now Assistant Scientist, WHOI)
- Kyra Han Kyul Kim, Geological Sciences, 2019 (now scientist, NASA JPL)
- Christopher Russoniello, Geological Sciences, 2018 (now faculty, University of Rhode Island)
- James Heiss, Geological Sciences, 2016 (now faculty, University of Massachusetts Lowell)
- Mahfuzur Khan, Geological Sciences, 2016 (now faculty, Dhaka University, Bangladesh)

MS Students

- Abigail McGraw, Earth Science, in progress
- Lauren Donati, Water Science and Policy, in progress
- Amanda Sprague-Getsy, Earth Sciences, in progress
- Fang Tan, Water Science and Policy, in progress (co-advised with P. Imhoff, CEE)
- Juan Pablo Dominguez, Earth Sciences, 2021
- Pieter Kreyens, Geological Sciences, 2019
- Kaileigh Scott, Civil and Environmental Engineering, 2015
- Christopher Russoniello, Geological Sciences, 2012
- Cristina Fernandez, Geological Sciences, 2012
- James Heiss, Geological Sciences, 2011

Undergraduate Researchers

- Abigail McGraw, Environmental Science, 2023 (senior thesis)
- Sarah Dente, Environmental Science, 2022-2023
- Paige Aldred, Environmental Science, 2021-2023
- Charles Kimsal, Geological Sciences, 2020-2021
- Kim Bieksha, Environmental Engineering, 2020
- Allie Bailey, Civil and Environmental Engineering, 2017-2018
- Caitlyn Sarno, Chemistry, 2016
- Shailja Gangrade, Civil and Environmental Engineering and Marine Biosciences, 2016
- Catherine Medlock, CZO REU & continuing, 2016
- Riley Brown, CZO REU, 2016
- Samuel Dever, Civil Engineering, 2015-2016
- Katie Li, CZO REU, 2015
- Eric Lunn, CZO REU, 2014
- Nathan Veale, DENIN Environmental Scholar, 2013-2014
- Kyle Crespo, Environmental Engineering, 2012
- Matthew Kereszi, Civil Engineering, 2012

- Deon Knights, Geology, 2011
- Andrew Musetto, Environmental Science, 2010-2011
- Emily Olson, Marine Biosciences, 2008-2010

Visiting Students and Researchers

- Wei Wang, Southern University of Science and Technology, China, 2024-2025
- Daniel Kretschmer, University of Potsdam, Germany, 2024
- Jie Yang, Leibniz University Hannover, Germany, 2014
- Sophie Ravel, Ecole Polytechnique, France, 2013

Service on Student Committees and Thesis Examinations

PhD Dissertations

- Austin Farnum, UD Civil, Construction and Environmental Engineering (Advisor: Carolyn Voter), in progress
 - Omowumi Erukubami, UD Earth Sciences (Advisor: Carolyn Voter), in progress
 - Endalkachew Kebede, UD Geography and Spatial Sciences (Advisor: Kyle Davis), in progress
 - Tianyin Ouyang, UD School of Marine Science and Policy (Advisor: Andrew Wozniak), in progress
 - Max Huffman, UD Earth Sciences (Advisor: Jim Pizzuto), in progress
 - Patricia Hurley, UD Civil & Environmental Engineering (Advisor: Yu-Ping Chin), in progress
 - Christy Li, UD Earth Sciences (Advisor: Jim Pizzuto), in progress
 - Goabaone Jacqueline Ramatlapeng, UD Earth Sciences (Advisor: Eliot Atekwana), in progress
 - Ruifang Hu, UD Plant & Soil Sciences (Advisor: Angelia Seyfferth), in progress
 - Mark Lundine, UD School of Marine Science and Policy (Advisor: Art Trembanis), 2023
 - Sean Fettrow, UD Plant & Soil Sciences (Advisor: Angelia Seyfferth), 2023
 - Aspen Anderson, Simon Fraser University (Advisor: Diana Allen), 2023
 - Daniel Zamrsky, Utrecht University (Advisor: Marc Bierkens), 2021
 - Rachel Housego, Woods Hole Oceanographic Institution/MIT Joint Program (Advisor: Britt Raubenheimer), 2021
 - Thi Minh Thuy Nguyen, University of Queensland (Advisor: Ling Li), 2020
 - Laura del Val Alonso, Universitat Politècnica de Catalunya (Advisor: Jesus Carrera), 2020
 - Sabina Rakhimbekova, University of Western Ontario (Advisor: Clare Robinson), 2019
 - Nur Syahiza Zainuddin, University of New South Wales (Advisor: Martin Andersen), 2019
 - Sebastien Huizer, Utrecht University (Advisor Marc Bierkens), 2019
 - Joseph Rawson, University of Western Australia (Advisor Henning Prommer), 2018
 - Gordon Osterman, Rutgers University Newark, Earth and Environmental Sciences (Advisor: Kristina Keating), 2017
 - Jing Yan, UD Plant and Soil Sciences (Advisor: Yan Jin), 2016
 - Bartholomew Wilson, UD Geological Sciences (Advisor: John Madsen), 2016
 - Megan Sebben, Flinders University, School of the Environment (Advisor: Adrian Werner), 2016
 - Tyler Evans, University of S Carolina, Earth and Ocean Sciences (Advisor: Alicia Wilson), 2016
 - Tariq Laattoe, Flinders University, School of the Environment (Advisor: Vincent Post), 2016
 - Jennifer Egan, UD Water Science and Policy Program (Advisor: Joshua Duke), 2016
 - Aline Pieterse, UD Geological Sciences (Advisor: Jack Puleo), 2015
 - Adam Pearson, UD Geological Sciences (Advisor: James Pizzuto), 2015
 - Shannon Holder, Simon Fraser University, Earth Sciences (Advisor: Diana Allen), 2014
 - Leanne Morgan, Flinders University, Earth Sciences, (Advisors: Adrian Werner and Craig Simmons), 2014
 - Sittinan Benjasupattananan, UD Civil and Environmental Engineering (Advisor: Chris Meehan), 2013
 - Maryan Akhavan, UD Civil and Environmental Engineering (Advisor: Paul Imhoff), 2013
 - Yoojin Jung, UD Civil and Environmental Engineering (Advisor: Paul Imhoff), 2009
- ##### **MS Theses**
- Bailee Street, UD Plant and Soil Sciences (Advisor: Angelia Seyfferth), in progress

- Omowumi Erukubami, UD Earth Sciences (Advisor: Carolyn Voter), in progress
- Ashley Pavia, UD School of Marine Science and Policy (Advisor: Mi-Ling Li), in progress
- Kopo Oromeng, UD Geological Sciences (Advisor: Eliot Atekwana), 2020
- Catherine Medlock, UD Geological Sciences (Advisor: Tom McKenna), 2020
- Alexis Cunningham, UD Water Science and Policy Program (Advisor: Jeremy Firestone), 2018
- Thomas Brooks, UD Geological Sciences (Advisor: Joanna York), 2018
- Frances Bothfield, UD Plant and Soil Sciences (Advisor: Angelia Seyfferth), 2015
- Zhuo Liu, UD Applied Economics and Statistics (Advisor: Kent Messer), 2012
- Robert Carver, McGill University, Earth and Planetary Sciences (Advisor: Jeffrey McKenzie), 2012
- Erin McVey, UD School of Public Policy and Administration (Advisor: Gerald Kauffman), 2011

STUDENT AWARDS and HONORS

- Dannielle Pratt, UD Doctoral Fellowship for Excellence, 2024
- Dannielle Pratt, Delaware Environmental Institute (DENIN) Environmental Fellow, 2022-2024
- Amanda Sprague-Getsy, UD Graduate Scholars Award, 2021-2023.
- Mary Hingst, Delaware Environmental Institute (DENIN) Environmental Fellow, 2021-2023.
- Julia Guimond, National Science Foundation Postdoctoral Fellowship, 2020.
- Ryan Frederiks, UNIDEL Distinguished Graduate Scholar Award, 2018-2023.
- Mary Hingst, WSP Program Fellowship, 2018-2019.
- Julia Guimond, UD Doctoral Fellowship Award, 2018-2019.
- Kyra Han Kyul Kim, CUAHSI Instrumentation Discovery Travel Grant, 2018.
- Kyra Han Kyul Kim, Delaware Environmental Institute (DENIN) Environmental Fellow, 2017-2019.
- Julia Guimond, Delaware National Estuarine Research Reserve Healthy Coastal Ecosystem Fellowship, 2016.
- Julia Guimond, Delaware Environmental Institute (DENIN) Environmental Fellow, 2016-2018.
- Julia Guimond, Geological Society of America Graduate Student Research Grant, 2016.
- Mahfuzur Khan, Delaware Environmental Institute (DENIN) Environmental Fellow, 2014-2016.
- Christopher Russoniello, University Graduate Fellowship, 2013-2014.
- Cristina Fernandez, US Department of Defense SMART Fellowship, 2011-2012.
- Christopher Russoniello, National Ground Water Association Farvolden Award for best student presentation, 2011.

UNIVERSITY, COLLEGE, & DEPARTMENTAL COMMITTEES and ACTIVITIES

University

- Federal Executive Orders Task Force (2025-present)
- Office of Sustainability Internal Advisory Committee (2024-present)
- Advisory Council, Center for Experimental and Applied Economics, CANR (2023-present)
- Director, Delaware Environmental Institute (DENIN) (2021-present)
- Climate Council, Mangone Climate Change Hub (2023-present)
- Program Committee and founding faculty member, Water Science and Policy Graduate Program (2010-present)
- UD CAREER Academy mentor (Carolyn Voter; 2024)
- Sustainability Council (2023-2024)
- Search Committee, Dean of the College of Agriculture and Natural Resources (2023)
- Search Committee, Associate Provost for Sustainability (2022)
- Co-organizer of UD NSF CAREER Academy and mentor (Pinki Mondal; 2019-2020)
- Co-lead of cluster hire of 6 faculty in Coastal Water Security and co-chair of search committees (2018-present)
- Advisory Committee Member for Delaware Energy Institute (2018-present)

- Associate Director for Interdisciplinary Initiatives of the Delaware Environmental Institute (DENIN) (2017-present)
- Campus Master Plan Research Committee (2019)
- Budget Model Graduate Tuition/Education Subcommittee (2017-2019)
- CAREER award junior faculty mentor (2017-2018)
- University Research Council (2010-present)
- Budget Model Graduate Tuition/Education Subcommittee (2017-2019)
- Campus Master Plan Research Committee (2019)
- Senior Vice Provost for Graduate and Professional Education Search Committee (2015-2016)

College

- Faculty mentor (Kyle Davis, Geography and Spatial Sciences; Miling Li, School of Marine Science and Policy)
- CEOE International Task Force (2017-present)
- Dean of College of Earth Ocean and Environment Search Committee (2016-2017)
- Delaware Geological Survey Director Search Committee (2010-2011)
- College Transitional Academic Council (2009-2011)
- Physical Ocean Science and Engineering Search Committee (2008-2009)

Department

- Earth Sciences Tenure-Track Faculty Search Committee (2023-2025)
- Faculty Mentor (Carolyn Voter, Civil and Environmental Engineering; Jennifer McConnell)
- Earth Sciences Promotion and Tenure Committee (2020-present)
- Earth Sciences Graduate Program Committee (2016-present)
- Civil and Environmental Engineering Lab Manager Search Committee (2022-2023)
- Civil and Environmental Engineering Geotechnical Faculty Search Committee (2022-2023)
- Earth Sciences External Department Chair Search Committee (2021-2023)
- Earth Sciences Strategic Planning Committee (2020-2022)
- Civil and Environmental Engineering Mentoring Committee (2020-2022)
- Earth Sciences External Department Chair Search Committee (2019-2020)
- Civil and Environmental Engineering Graduate Committee (2017-2020)
- Geological Sciences Strategic Planning Committee (2017-2019)
- Chair, Geological Sciences External Department Chair Search Committee (2013-2014)
- Civil and Environmental Engineering Search Committee (2015-2016)
- Geological Sciences Internal Department Chair Search Committee (2012)
- Geological Sciences Department Graduate Admissions Committee (2011-2012)
- Organized Geological Sciences Seminar Series (Spring 2010, Fall 2013)
- Civil and Environmental Engineering Search Committee (2009-2010)

PROFESSIONAL ACTIVITIES and SERVICE (selected)

Service to Professional Organizations

- GSA Meinzer Award Committee (2022-present)
- Associate Editor, *Water Resources Research* (2014-present)
- American Geophysical Union Horton Research Grant Awards Committee (2020-2022)
- American Geophysical Union Groundwater Technical Committee (2016-present); Chair (2017-2019)
- Geological Society of America Hydrogeology Division Birdsall-Dreiss Lecture Award Committee (2017-2021)
- Salt Water Intrusion Meeting (SWIM) Scientific Committee (2008, 2010, 2016, 2018, 2020), Organizing Committee (2016, 2023, 2025), Advisory Committee (2020)
- Board of Directors (elected), Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI) (2013-2019)
- Co-organizer of 2018 CUAHSI Biennial Conference in Shepherdstown, WV
- Lead organizer of 2016 CUAHSI Biennial Conference in Shepherdstown, WV

- CUAHSI representative to the Geological Society of America Hydrogeology Division (2014-2018)
- Deputy Chair, American Geophysical Union Groundwater Technical Committee (2015-2017)
- Presenter in National Ground Water Association webinar: “Groundwater and Salt Town Hall: Restoring the Equilibrium after Severe Weather Events” (February 19, 2014 and Q&A for re-broadcast, December 2, 2014)
- Associate Editor: *Hydrogeology Journal*, the journal of the International Association of Hydrogeologists (2009-2013)
- University of Delaware representative to CUAHSI (2011-2023)

Service to Government Agencies

- Delaware Department of Natural Resources and Environmental Control (DNREC) Technical Climate Advisory Committee (2024-present)
- Department of Energy Coastal Observations, Mechanisms, and Predictions Across Systems and Scales (COMPASS) project Advisory Board (2021-present)
- NSF Science and Technology Center pre-proposal panel member (2022)
- Expert contributor to video module for the Federal Judicial Center for informing federal judges on issues related to the Clean Water Act, County of Maui vs Hawaii Wildlife Fund (2021)
- Delaware Sea Level Rise Technical Committee (2015-2018)
- Search committee member for Delaware Department of Natural Resources and Environmental Control Director of Coastal Programs (Fall 2016)
- Participated, by invitation, in National Academy of Engineering Kavli Frontiers of Science Brazil Symposium (2014)
- Participated, by invitation, in National Academy of Sciences Kavli Frontiers of Science U.S. Symposium (2012)
- Participated, by invitation, in NSF EarthCube Early Career Strategic Visioning Workshop (2012)
- Participated, by invitation, in NSF-sponsored workshop on *Marine Constituent Dynamics in Coastal Egypt* as part of the 3rd International Conference on Aquatic Resources (ICAR) conference in Alexandria, Egypt (2009)
- USGS Colleague Reviewer for 3 manuscripts, one book foreword, and many conference abstracts

Other Activities

- Sustainable Management of Offshore Groundwater Resources (SMART) Advisory Board (2023-present)
- The Dynamic Deep Subsurface of High Energy Beaches (DynaDeep) Project Advisory Board, German Research Foundation, (2021-present)
- Board of Directors, Stroud Water Research Center (2016-present); Science Committee Chair (2019-present)
- Member of the Delaware Center for the Inland Bays Scientific and Technical Advisory Committee (2010-present)
- Invited participant and speaker for first Indo-US Bilateral Workshop on Coastal Groundwater Dynamics Combining Future Climate Change and Human Development, Pondicherry University, India (2018)
- Board of Directors, NorthSouth Group for Poverty Reduction (2008-2023)
- Invited participant and speaker for first Indo-US Bilateral Workshop on Coastal Groundwater Dynamics Combining Future Climate Change and Human Development, Pondicherry University, India (2018)
- Instructor for NCED2 Summer Institute on Earth-surface Dynamics (2017)
- Invited participant in ONE-Delta (synthesizing Observational, Numerical, and Experimental data to unravel the complex dynamics of deltas and margin sequences) STEPPE (Sedimentary geology, Time, Environment, Paleontology, Paleoclimatology, and Energy) consortium workshop, Vanderbilt University (2016)
- Represented DENIN and the Department of Geological Sciences at UD Day in Washington DC, Capitol Hill (2013)

- Local organizing committee member and panel co-chair for the Sixth International Conference on Sustainable Water Environment, “Water Infrastructures in Time of Climate Change”, Newark, DE (2010)

OUTREACH (selected)

- Panelist for NSF Critical Zone Webinar: *Introduction to CZNet: the US Critical Zone Collaborative Network* (October 9, 2023)
- Presenter and panelist for the Massachusetts Municipal Vulnerability Preparedness Grant Project and the Plymouth Saltwater Intrusion Taskforce, (February 11-12, 2022)
- Panelist for CUAHSI Cyberseminar: *Navigating Academic Water: Essential Skills to Thrive as a Student and Early Career Scientist*. (April 2020)
- Lecturer in Environmental Issues Class at Osher Institute of Lifelong Learning, Wilmington (Fall 2015; Fall 2019)
- Presenter for Interdisciplinary Science Learning Laboratories speaker series, “New Connections: Creating Interdisciplinary Knowledge through Community Engagement”. (2017)
- Panelist for “Let’s Talk About Water” event at UD sponsored by CUAHSI (2017)
- Presented at the Delaware National Estuarine Research Reserve Symposium (April 12, 2017)
- Lectured on seawater intrusion at the Source Water Assessment and Protection Program Citizens and Technical Advisory Committee (CTAC) Meeting of the Delaware Department of Natural Resources & Environmental Control (May 2016).
- Gave UD Scholar in the library lecture (April 2016).
- Worked with the Delaware Nature Society to develop an outdoor educational program on mathematics in the geosciences for inner-city high school students (2012-2018)
- Speaker for the Delaware Center for the Inland Bays Scientific and Technical Advisory Committee Meetings (2008, 2012)
- Led field activities for the University of Delaware TIDE Camp for high school students (2011, 2013, 2014, 2016, 2017)
- Presenter and Panel Discussant for the “Focus on the Coast” seminar series, organized by Delaware Sea Grant to communicate science-based information to government officials and concerned citizens (2012)
- Served on an interdisciplinary research panel on the topic, “Getting to know you: why environmental scientists, humanists, and social scientists need each other and how they can join forces to save the planet” for the Delaware Environmental Institute Research Symposium (2012)
- Presented “Watershed groundwater interactions” (2012, 2013) and “Exploring submarine groundwater discharge at Indian River Bay” (2010) at the University of Delaware Coast Day.
- Speaker for the Science Teacher Development Cluster, a workshop organized by the NSF EPSCoR RII, a statewide program to develop research and education capacity (2011, 2012)
- Served on a career panel for the Educational Advancement Alliance Historically Black Colleges and Universities scholars program (UD McNair Program) (2011)
- Filmed by the Concord Consortium for NSF-funded middle school education project, High Adventure Science (DRL-0929774) (2011)
- Served on a career panel for INBRE-EPSCoR Summer Seminar Series (2010)
- Spoke at the Delaware Tech Watershed Institute, a program for middle school and high school science teachers, “Investigating groundwater discharge into coastal bays” (2009)
- Advised middle school students on Lego FIRST team (Caravel Academy, Newark, DE) (2009)
- Involved a teacher in summer research from the Southern Connecticut State University Institute for Science Instruction and Study (ISIS) program, a Sixth-year Certificate Program in Science Education (2009)