

ELIZABETH H. DAVIS

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Coastal & Ocean Processes Section
VIMS, William & Mary
Andrews Hall, 1309 Greate Road
Gloucester Point, VA 23062

EDUCATION

2026 **Ph.D. in Coastal and Marine Sciences, Virginia Institute of Marine Science (VIMS), William & Mary**
Concentration: Geological Oceanography
Sub-concentration: Marine Policy
Thesis: *Intrinsic Properties Influencing Coastal Dune Dynamics and Resilience*
Advisor: Dr. Christopher Hein

2020 **M.S. in Geological Sciences, University of Delaware**
Thesis: *A Reassessment of the Late Quaternary Surficial Geology of the Lower Delmarva Peninsula, VA*
Advisor: Dr. Michael O'Neal

2016 **B.A. in Environmental Geoscience, West Virginia University**
Graduated *Summa Cum Laude*
Minored in Geology and Geography

PROFESSIONAL EXPERIENCE

2020–2026 **Graduate Research Assistant, VIMS – Gloucester Point, VA**
Designed and led field, laboratory, and numerical modeling experiments to quantify which physical and ecological characteristics of coastal sand dunes reduce erosion during storms. Co-managed federal awards and research grants.

2021 **Intern, US Army Corps of Engineers, ERDC – Field Research Facility, Duck, NC**
Collect, process, and analyze various field data to investigate the coupled role of ecology & sedimentology on beach and dune dynamics and morphology. Quantify physical differences between natural and constructed (i.e., man-made) coastal sand dunes and assess the implications for resilience to storm erosion and flooding hazards.

2018–2020 **Graduate Research Assistant, University of Delaware – Newark, DE**
Used Native American cultural artifacts and radiocarbon dating to refine USGS geological maps of the Eastern Shore of Virginia.

2017–2019 **Staff Geoscientist, AECOM — Conshohocken, PA**
Conduct remedial investigations. Apply US Environmental Protection Agency (EPA), Pennsylvania & New Jersey Department of Environmental Protection Technical Guidance documents, laws, and policies to remediation projects for various contaminated media and ensure efficient site closure. Compose technical regulatory reports.

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2016–2017	Environmental Geoscientist, Kleinfelder, Inc. — Hamilton, NJ Case Manager of former ExxonMobil petroleum retail sites. Compose technical regulatory reports and conduct remedial investigations. Evaluate site-specific natural conditions and plan remedial actions meeting a variety of regulatory factors and guidelines.
2016	Intern, Friends of Decker's Creek — Morgantown, WV Facilitate community outreach & education regarding environmental degradation of local watershed on behalf of 501(c)(3) nonprofit organization. Coordinate volunteer groups for maintenance & restoration.

FELLOWSHIPS & SCHOLARSHIPS

2024–2025	MacWhorter Family Fellowship (\$3,168), VIMS
2024–2025	Scholars Award (\$25,000), Philanthropic Educational Organization (P.E.O.)
2023–2024	James E. & Anne McCracken Rogers Fellowship (\$2,282), VIMS
2022–2023	Bruce K. Goodwin Fellowship (\$2,342), VIMS
2021–2022	Zeigler Fellowship (\$3,000), VIMS
2020–2021	R. Gordon & Catherine B. Smith Fellowship (\$3,000), VIMS
2020–2022	Provost Distinguished Graduate Fellowship (tuition waiver, \$36,000), VIMS
2012–2016	Academic Excellence II Scholarship (\$24,000), West Virginia University
2012–2016	Greater Tuckahoe Area Merchant's Association Scholarship (\$3,000)
2015–2016	Philip & Michal Flach Scholarship (\$2,000), West Virginia University
2014–2015	David Charnews Scholarship (\$3,000), West Virginia University
2013–2014	Eberly College of Arts & Sciences Scholarship (\$1,500) West Virginia University

GRANTS, HONORS, & AWARDS

2024	Outstanding Student Presentation Award , American Geophysical Union Fall Meeting 2023
2023	Best Student Paper Award , Coastal Sediments '23 Conference
2021	Equipment Trust Fund Grant (\$2,000), VIMS
2020	Graduate Student Government Outstanding Senator , University of Delaware
2019	Graduate Student Research Grant (\$1,875), Geological Society of America
2016	Undergraduate Enrichment Award (\$250), Eberly College of Arts & Sciences, West Virginia University
2016	Environmental Geoscience Outstanding Senior , West Virginia University
2016	Phi Beta Kappa , Alpha Chapter of West Virginia University

Travel Grants

2025	Batten School of Coastal & Marine Science (\$500), VIMS
2024	Graduate Student Association Travel Grant (\$300), VIMS
2024	Batten School of Coastal & Marine Sciences Travel Grant (\$600), VIMS
2023	Graduate Student Association Travel Grant (\$300), VIMS
2023	School of Marine Science Travel Grant (\$500), VIMS
2021	Lou Burnett Award (\$300), Southern Association of Marine Laboratories

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2020
2020

Kenneth Weaver Student Travel Grant (\$120), Geological Society of America
Graduate Student Travel Grant (\$600), University of Delaware

PUBLICATIONS

Journal Articles

3. White, A.E., Cohn, N., **Davis, E.H.**, Hein, C.J., Zinnert, J.C., (2024). "Coastal dune management affects above and belowground biotic characteristics" *Nature Scientific Reports*. <https://doi.org/10.1038/s41598-024-73312-z>
2. Heminway, S.S.*., Cohn, N., **Davis, E.H.**, White, A.E., Hein, C.J., Zinnert, J.C. (2024). Exploring Ecological, Morphological, and Environmental Controls on Coastal Foredune Evolution at Annual Scales Using a Process-Based Model. *Sustainability*, 16(8), 3460. <https://doi.org/10.3390/su16083460>
1. **Davis, E.H.**, Hein, C.J., Cohn, N., White, A.E., Zinnert, J.C. (2024). Differences in internal structure between natural, managed, & constructed coastal dunes. *Geomorphology*, 109083. <https://doi.org/10.1016/j.geomorph.2024.109083>

Conference Proceedings

3. **Davis, E.H.**, Hein, C.J., Cohn, N., Zinnert, J.C., Hein, E.A. (2025). "Eco-morphodynamic dune response to beach nourishment along the northern Outer Banks Coast, North Carolina, USA, *The Coastal Dynamics Proceedings 2025*.
2. **Davis, E.H.**, Cohn, N., Heminway, S.S.*., Skaden, J., Hein, C.J. (2023). Linking Variations in Internal Coastal Foredune Moisture Dynamics to Erosion Vulnerability, *The Coastal Sediments Proceedings 2023*, World Scientific. https://doi.org/10.1142/9789811275135_0062 (awarded Best Student Paper)
1. Heminway, S.S*, **Davis, E.H.**, Cohn, N., Skaden, J., Anderson, A., Hein, C.J. (2023). Modeled changes in foredune morphology influenced by variable storm intensity and sea-level rise, *The Coastal Sediments Proceedings 2023*, World Scientific. https://doi.org/10.1142/9789811275135_0064

Data

2. White, A.E., Cohn, N., **Davis, E.H.**, Hein, C.J., & Zinnert, J.C. (2024). Coastal Foredune Belowground Biomass, Aboveground Biomass, and Species Cover [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.11370397>
1. **Davis, E.H.**, Hein, C.J., Cohn, N., White, A.E., & Zinnert, J.C. (2023). North Carolina Outer Banks, USA Coastal Foredune Sediment Cores - Grain Size Data & Core Log Descriptions (1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.10137063>

PUBLICATIONS in PROGRESS

2. **Davis, E.H.**, Cohn, N., Zinnert, J.C., Hein, C.J. "Modeling vegetation-driven feedbacks on coastal dune erosion and recovery" (*in prep*)

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2. **Davis, E.H.**, Hein, C.J., Cohn, N., & Zinnert, J.C. "The conditional role of internal dune sedimentologic and biotic structure in moderating storm-induced coastal foredune erosion" (*in revision*)

*Denotes undergraduate mentee.

NON-PEER-REVIEWED PUBLICATIONS

2025 **Davis, E.H.**, "Intrinsic Properties Influencing Coastal Dune Dynamics and Resilience" Doctoral Dissertation. Virginia Institute of Marine Science, William & Mary.

2025 Hein, C.J., Boggess, A., Cahoon, K., **Davis, E.H.**, Ciarletta, D., Georgiou, I.Y., Harris, M., Hein, E.A., McCormick, W.M., Shawler, J. "Holocene Barrier Dynamics and Management on the Eastern Shore of Virginia". Virginia Geological Field Conference 2025, Field Trip Guide.

2022 **Davis, E.H.**, Haddad, J., "Defining & Striving for Resilience in Virginia's Transportation Sector", White Paper. Virginia Coastal Policy Center, VA.
<https://scholarship.law.wm.edu/vcpclinic/73>

2022 **Davis, E.H.**, Shifting Sands: Coastal Dunes in Motion. VA SEA 2022 Lesson Plans. Virginia Institute of Marine Science, William & Mary. (215+ downloads)
<https://doi.org/10.25773/1w8b-jy21>

2020 **Davis, E.H.**, "A Reassessment of the Late Quaternary Surficial Geology of the Lower Delmarva Peninsula, VA", Masters Thesis. University of Delaware, Delaware. <https://udspace.udel.edu/handle/19716/27964>

2017 **Davis, E.H.**, Garrison, S., "Remedial Investigation Report/Remedial Action Report for Exxon Mobil Service Station #32229". Regulatory Compliance Report submitted to the NJ DEP, New Jersey.

INVITED RESEARCH TALKS

2024 **Davis, E.H.**, Hein, C.J., Cohn, N. White, A., Zinnert, J.C., "The role of internal coastal foredune structure in mediating storm-induced erosion", *Abstract ID# 1523088, AGU Fall Meeting*, Washington D.C., USA

2024 **Davis, E.H.**, Smith, S. Coastal dunes and their role in coastal resiliency. *P.E.O. Virginia State Conference*. Roanoke, VA, USA

2022 **Davis, E.H.**, Molino, G.G. Sea-level rise impacts on rural and developed coasts. *Virginia Engineers Conference*. Newport News, VA, USA

CONFERENCE ABSTRACTS & PRESENTATIONS

2025 Zeman, J.L.* **Davis, E.H.**, Cohn, N., Zinnert, J.C., Hein, C.J. "Assessing the impact of beach nourishment on the morphology and sedimentology of coastal foredunes" *Geological Society of America (GSA) Southeast Section Meeting*, Harrisonburg, VA, USA

2025 **Davis, E.H.**, Hein, C.J., Cohn, N., Zinnert, J.C., Hein, E.A. "Eco-morphodynamic dune response to beach nourishment along the northern Outer Banks coast, North Carolina, USA", *Coastal Dynamics 2025*, Aviero, Portugal

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2023 **Davis, E.H.**, Hein, C.J., Cohn, N., White, A.E., Zinnert, J.C. "Ecomorphostratigraphic differences between natural, managed, and constructed foredunes and implications for dune response to storm impacts", *Abstract ID # 1324317, American Geophysical Union Fall Meeting 2023*, San Francisco, CA, USA

2023 Zinnert, J.C., White, A.E., Cohn, N., **Davis, E.H.**, Hein, C.J. "Quantifying the effect of management on biotic and abiotic properties of coastal foredunes above and below ground", *American Shore & Beach Preservation Association National Coastal Conference*, Providence, RI, USA

2023 **Davis, E.H.**, Hein, C.J., Cohn, N., White, A.E., Zinnert, J.C. "The role of internal dune structure in moderating dune response to storm impacts", *UNESCO International Geoscience Programme (IGCP) 725: Forecasting Coastal Change, Annual Meeting*, Florianopolis, Brazil

2023 White, A., Cohn, N., **Davis, E.H.**, Hein, C.J., Zinnert, J.C. "Variability & Elevation Drive Changes in Plant Community & Belowground Biomass in Coastal Dunes of the Outer Banks", *Abstract ID# 7364, Associated of Southeastern Biologists Annual Meeting*, Winston-Salem, NC, USA

2023 Heminway, S.S.*., **Davis, E.H.**, Cohn, N., Hein. C.J. "Modeled influence of variable storm intensity and sea-level rise on barrier island foredune stability" *Abstract ID# 385846, Geological Society of America (GSA) NE-SE Joint Section Meeting*, Reston, VA, USA

2022 **Davis, E.H.**, Cortes, I., Sanks. K., Van Blunk, A., & Bastianon, E. "Exploring the interaction of salt marsh and mangrove vegetation on river delta evolution" *Community Surface Dynamics Modeling System Annual Meeting*, Boulder, CO, USA

2021 **Davis, E.H.**, Hein, C.J., Cohn, N., White, D., Zinnert, J.C., Hein, E.A. "Morphostratigraphic Differences Between Natural, Managed, and Constructed Coastal Foredunes" *Abstract ID #891481, American Geophysical Union Fall Meeting*, New Orleans, LA, USA

2021 **Davis, E.H.**, Hein, C.J., Cohn, N., White, D., Zinnert, J.C., Hein, E.A. "Coupled ecologic and sedimentologic controls on coastal foredune resilience to storm impacts" *Abstract ID #9482, Coastal and Estuarine Research Federation (CERF)*, Virtual Format

2021 Cohn, N., White, D., **Davis, E.H.**, Goldstein, E., Zinnert, J.C., Hein, C.J. "Alongshore variable coastal foredune responses: de-coupling morphologic, ecological, and anthropogenic controls", *CERF*, Virtual Format

2021 White, D., Ramos, K., Cohn, N., **Davis, E.H.**, Goeke, M.E., Hein, C.J., Zinnert, J.C. "Patterns and characteristics of belowground biomass distribution across natural and managed coastal foredunes" *Abstract ID #9387, CERF*, Virtual Format

2021 White, D., Ramos, K., Cohn, N., **Davis, E.H.**, Goeke, M.E., Hein, C.J., Zinnert, J.C. "Belowground differences in the biotic structure of natural and unmanaged coastal foredunes" *Abstract ID #93950, Ecological Society of America*, Virtual Format

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2020 **Davis, E.H.**, O’Neal, M.A., Lowery, D.L. “A new stratigraphic interpretation of the Delmarva Surface Sands, Virginia USA” *Abstract ID# 344850, GSA NE-SE Joint Section Meeting*, Reston, VA, USA

2020 **Davis, E.H.**, O’Neal, M.A. “Reassessing the depositional history of the lower Delmarva Peninsula, VA using cultural artifacts” *University of Delaware Graduate Student Forum for Research and Creative Work*, Newark, DE, USA (cancelled due to COVID-19 pandemic)

*Denotes undergraduate mentee.

FIELD EXPERIENCE

2024 **Direct-push drilling using a Geoprobe 6620DT** drill rig to collect sediment cores and optically-stimulated luminescence (OSL) samples on Virginia’s Eastern Shore, USA.

2022–2024 **Sedimentologic & geospatial data collection** (15 transects sampled ~20 times over a 1-year period) using a sediment grab sampler and real-time kinematics-(RTK) GPS in the Outer Banks, North Carolina.

2022 **Coastal Environments – Beaches & Barrier Islands Field Course**, Virginia, North Carolina, South Carolina, & Georgia, USA.

2020 **Sedimentologic, stratigraphic, geophysical, & geospatial data collection** (8 transects) using a vibracoring system, MALA ground-penetrating radar, and RTK-GPS in the Outer Banks, North Carolina.

2020 **Vibracore collection aboard the R/V Peregrination** as part of the Virginia Port Authority Shallow Water Dredging Project, VIMS Shoreline Studies Program

2019 **Geology of the Southwest Field Course**, Texas & New Mexico, USA

2016–2019 **Groundwater sampling** (low-flow & standard purge) via Monsoon, “whale”, Grunfos, & bladder pumps in accordance with NJ Department of Environmental Protection (DEP) Field Sampling Procedures and PA & NY technical guidelines

2016–2019 **Drilling health & safety and technical compliance oversight** of subcontractors via direct push, dual tube, hollow stem auger, and air & mud rotary drilling methods

2016–2018 **Excavation & underground storage tank removal** health & safety and technical compliance oversight of contractors

2016–2018 **In-situ remediation technical compliance oversight** via injection wells & direct-push borings

2016–2019 **Soil sampling** from borings and sediment piles in accordance with NJ DEP Field Sampling Procedures

2015–2019 **Soil classification** of soil borings in accordance with USDA, Unified Soil Classification System, & Modified Burmister classification systems

2015–2018 **Stream & surface water sampling** using Hach Stream Survey Test kits in accordance with NJ DEP Field Sampling Procedures

TECHNICAL SKILLS

Programming Languages: R, MATLAB, Python
Operating Systems: Linux, Windows, Apple

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Numerical Models: AeolLiS, PyDeltaRCM, XBeach

Version Control: GitHub

Software Packages: GIS (ESRI ArcGIS Desktop Certified), Spyder, PyCharm, Adobe Illustrator, Inkscape, JMP, RadExplorer, LaTeX, CloudCompare, MS Office, LibreOffice

Field & Lab Methods: Emblid RTK-GPS, CAMSIZER X2, GSSI & MALA ground-penetrating radar (GPR), Trimble Geo 7X handheld GNSS System, Total Station Survey, terrestrial LiDAR laser scanner, wetland delineation (via 987 USACE Wetlands Delineation Manual & Regional Supplements), watershed assessment (US EPA Procedure # 841-B-99-002), environmental impact assessment

WORKSHOPS & TRAINING

Technical

2023 **AeolLiS Short Course**, Coastal Sediments '23, New Orleans, LA
2023 **Headland Sediment Bypassing: Integrating field and observational data and numerical modelling to forecast downdrift beach growth and erosion**, Universidade Federal de Santa Catarina, Florianopolis, Brazil
2022 **Earth Surface Processes Institute Spring School** (Selected Participant), Community Surface Dynamics Modeling System, University of Colorado Boulder
2021 **XBeach Course – Morphodynamic Modelling During Storm Conditions**, Deltares Academy

Science Policy & Communication

2022 **Geoscience Congressional Visits Day** (Selected Participant), AGU, Washington D.C.
2022 **Story Collider**, hosted by Virginia Sea Grant, VIMS, & Chesapeake Bay National Estuarine Research Reserve (NOAA Office for Coastal Management)
2022 **Science Communication to Get Policymakers' Attention**, Research-to-Policy Collaboration, AAAS Annual Meeting
2022 **Road to Richmond**, Office of Government Relations, William & Mary
2021 **Skills for Science: Science Storytelling**, AGU Fall Meeting, New Orleans
2021 **Catalyzing Advocacy in Science & Engineering (CASE) Workshop**, American Association for the Advancement of Science (AAAS)
2021 **Coastlines and People Workshop** (Recurrent Flooding & Research Priorities), National Science Foundation (NSF), Old Dominion University
2021 **Science Policy Bootcamp**, University of Virginia

Diversity, Equity, & Inclusion

2022 **Fostering Diversity, Equity, and Inclusion into Interdisciplinary Marine Research**, Interdisciplinary Marine Early Career Network
2022 **Inclusive Leadership Workshop**, PwC, William & Mary
2020 **Bystander Intervention Workshop**, AdvanceGEO Partnership, University of Delaware

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PUBLIC OUTREACH & STAKEHOLDER ENGAGEMENT

2024	Stakeholder Workshop Co-Host , "Dynamic Dunes: Scientific Advances for Improved Management", US ACE Field Research Facility, Duck, NC
2023	Presenter , <i>A Scientist Walks Into a Bar</i> science outreach series, Williamsburg, VA
2023	Volunteer , James River Watch, James River Association, Richmond, VA
2022–2023	Scientist Volunteer , non-profit <i>Letters to a Pre-Scientist</i> program that connects scientists to under-served middle school students to foster STEM engagement
2022	Discovery Lab Volunteer , Science Museum of Virginia
2022	Virginia Scientist & Educators Alliance Lesson Plan Expo , present original K-12 classroom-tested lesson plan based on dissertation research, VIMS, VA
2021	Stakeholder Workshop Co-Facilitator , "Cultivating a Better Understanding of Local Coastal Dune Dynamics & Management Needs", US ACE Field Research Facility, Duck, NC
2021	Invited Speaker , "Increasing coastal resiliency with dunes" talk given to undergraduate course Quaternary Climate Change, Weber University, UT
2021	Scientist Volunteer , non-profit <i>Virginia Scientist-Community Interface</i> group that aligns a coalition of scientists with non-profits to affect policy
2020–pres.	Visiting Scientist , non-profit <i>Skype a Scientist</i> program that connects scientists to K-12 classrooms across the United States (10+ sessions)
2018, 2019	Volunteer , Coast Day, University of Delaware, Lewes, DE

TEACHING EXPERIENCE

2018–2020	Graduate Teaching Assistant , University of Delaware GEOL304: <i>Sedimentology and Stratigraphy</i> ; enroll: 19 GEOL115: <i>Geologic Hazards</i> ; enroll: 25 GEOL110: <i>Earth's Evolving Systems</i> ; enroll: 75
2013–2016	Academic Tutor , West Virginia University Athletic Department Tutor English, Geography, Geology, GIS Technology, & Spanish. Aid in time management and organizational skills.

STUDENT ADVISING & MENTORING

2023–2024	Julia Zeaman , <i>Undergraduate Senior Thesis</i> , William & Mary. Assessing the Impact of Beach Nourishment on the Morphology and Sedimentology of Coastal Foredunes in the Outer Banks, North Carolina.
2022	Ethan Stewart , <i>Scholars Undergraduate Research Experience</i> , William & Mary. Collect and analyze baseline data to quantify spatial & temporal variability of beach/dune grain size & morphology prior to beach nourishment.
2021–2023	Selwyn Heminway , <i>Undergraduate Senior Honors Thesis</i> , William & Mary. Modeling effects of variable storm intensity and rates of sea-level rise on dune morphology in Outer Banks, North Carolina, USA.
2020–2021	Melanie Strik , <i>Undergraduate Senior Thesis</i> , William & Mary.

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Investigating sedimentologic differences between natural dunes and constructed dunes utilizing GPR and vibracore data, Outer Banks, North Carolina.

PROFESSIONAL SERVICE

2024	Journal Reviewer , <i>Estuaries & Coasts</i> x 1; <i>Geomorphology</i> x 1
2023	Co-Convener , Coastal Geomorphology Session, AGU Fall Meeting, San Francisco, CA
2023	VIMS Representative , United Nations Water Conference, New York City, NY
2023–2026	Education Policy Sub-committee Representative , Academic Council, VIMS
2023	Reviewer , VIMS Graduate Student Association Research Grants
2022	Course Development Working Group , “Responses to Climate Change: A Comparison of Opportunities for Potential Solutions in the Netherlands and the Coastal United States”, William & Mary
2021–pres.	Founding Co-Director , Science Policy Initiative at VIMS/W&M
2021–2023	Committee Member , Professional Development Committee, VIMS
2021	PostDoc Search Committee , Coastal Geology Lab, VIMS
2020–2022	VIMS Graduate Student Representative , William & Mary Student Conduct Council
2019–2020	Graduate Student Government Senator , University of Delaware (UD) Department of Geological Sciences
2019	Assistant Coordinator , UD GEO Job Fair
2018–2020	Co-Chair , Sustainability Committee, UD Graduate Student Government
2015–2016	President , WVU Gamma Theta Upsilon Chapter

PROFESSIONAL ASSOCIATIONS & MEMBERSHIPS

2022–pres.	Women in Coastal Geoscience & Engineering (WCGE)
2022–pres.	Community Surface Dynamics Modelling System (CSDMS)
2021–2024	National Science Policy Network (NSPN)
2019–pres.	Society for Women in Marine Science (SWMS)
2019–pres.	American Geophysical Union (AGU)
2018–2022	Geological Society of America (GSA)
2016–pres.	Phi Beta Kappa, Alpha Chapter of West Virginia
2013–2016	Gamma Theta Upsilon (National Honorary Geography Society)