

## Zach Hilgendorf

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Email: [hilgenzt@uwec.edu](mailto:hilgenzt@uwec.edu)

### EDUCATION

Arizona State University  
Tempe, AZ

**PhD in Geography, 2022**

Dissertation: *Landscape Evolution in Response to Dynamic Coastal Dune Restoration: Case Studies from the California Coast*

Advisor: Ian Walker, PhD

Minnesota State University-Mankato  
Mankato, MN

**M.S. in Geography, 2018**

Thesis: *The efficacy of best management practices on peak discharge and contaminant loads in agricultural drainage systems, Blue Earth River watershed, south-central Minnesota, USA*

Advisor: Phillip Larson, PhD

University of Wisconsin-Eau Claire  
Eau Claire, WI

**B.S. in Environmental Geography, 2015**

### EMPLOYMENT

- |              |                                                                                                                                                                                                                                                                                                                                    |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2022-present | Visiting Assistant Professor<br>Department of Geography and Anthropology, University of Wisconsin-Eau Claire<br>GEOG 104: Planet Earth: The Physical Environment<br>GEOG 178: Planet Earth: Conservation of the Environment<br>GEOG 340: Climatology<br>GEOG 341: Weather and Society<br>GEOG 364: Fluvial Processes and Landforms |
| 2021-present | Research Associate/UAS Pilot<br>Department of Geography, University of California, Santa Barbara                                                                                                                                                                                                                                   |
| 2021-2022    | Teaching Assistant (GPH 112: Introduction to Physical Geography)<br>Geographical Sciences and Urban Planning, Arizona State University                                                                                                                                                                                             |
| 2021-2022    | Teaching Assistant (GPH 267: Extreme Weather)<br>Geographical Sciences and Urban Planning, Arizona State University                                                                                                                                                                                                                |
| 2020         | Research Assistant (Spatial Analysis and Research Center)<br>Geographical Sciences and Urban Planning, Arizona State University                                                                                                                                                                                                    |
| 2020         | GIS Technician<br>California Waterfowl Association                                                                                                                                                                                                                                                                                 |
| 2019-2021    | Instructor (GPH 211: Landform Processes)<br>Geographical Sciences and Urban Planning, Arizona State University                                                                                                                                                                                                                     |
| 2018-2020    | Research Assistant (Earth Surface Processes and Geomorphology Lab)<br>Geographical Sciences and Urban Planning, Arizona State University                                                                                                                                                                                           |
| 2017-2018    | Teaching Assistant (GEOG 474/574: Introduction to Remote Sensing)<br>Department of Geography, Minnesota State University, Mankato                                                                                                                                                                                                  |

- 2017-2018 Teaching Assistant (GEOG 481/581: GIScience and Historical Environmental Hazards)  
Department of Geography, Minnesota State University, Mankato
- 2016-2017 Research Assistant  
Department of Chemistry and Geology, Minnesota State University, Mankato
- 2016, 2018 Teaching Assistant (GEOG 416W/516W: Fluvial Geomorphology and Hydrology)  
Department of Geography, Minnesota State University, Mankato
- 2015-2016 Teaching Assistant (GEOG 101: Introduction to Physical Geography)  
Department of Geography, Minnesota State University, Mankato
- 2014-2015 Undergraduate Preceptor (GEOG 104: Introduction to the Physical Environment)  
Department of Geography and Anthropology, University of Wisconsin-Eau Claire

**REFEREED PUBLICATIONS (\* Denotes undergraduate collaborator)**

- 1) Walker, I.J., **Hilgendorf, Z.**, Gillies, J.A., Turner, C.M., Furtak-Cole, E., Nikolich, G., 2023. Assessing performance of a 'nature-based' foredune restoration project, Oceano Dunes, California, USA. *Earth Surface Processes and Landforms* 48:1, 143-162. <https://doi.org/10.1002/esp.5478>
- 2) **Hilgendorf, Z.**, Walker, I.J., Pickart, A.J., Turner, C.M., 2022. Dynamic restoration and the impact of native versus invasive vegetation on coastal foredune morphodynamics, Lanphere Dunes, California, USA. *Earth Surface Processes and Landforms* 47:13, 3083-3099. <https://doi.org/10.1002/esp.5445>
- 3) Furtak-Cole, E. Gilles, J.A., **Hilgendorf, Z.**, Walker, I.J., Nikolich, G., 2022. Simulation of flow and shear stress distribution on the Oceano Dunes, implications for saltation and dust emissions. *Environmental Fluid Mechanics* 22, 1399-1420. <https://doi.org/10.1007/s10652-022-09902-0>
- 3) Shandonay, K.L., Moll, H., Marvin, M.C.\*, López-Castañeda, N., Kelley, M., **Hilgendorf, Z.**, Heintzman, R., Dorn, R.I., 2021. The Fieldwork of Shared Experiences. *The Geographical Bulletin* 62, 82–88. <https://www.gammathetaupsilon.org/the-geographical-bulletin/2020s/volume62-2/A/article7.pdf>
- 4) Walker, I.J., Turner, C.M., **Hilgendorf, Z.**, 2021. Comparing UAS and terrestrial laser scanning (TLS) methods for change detection in coastal landscapes, in: Frazier, A.E., Singh, K.K. (Eds.), *Fundamentals of Capturing and Processing Drone Imagery and Data*. p. 385.
- 5) Kedron, P., Quick, M., **Hilgendorf, Z.**, Sachdeva, M., 2021. Using the specification curve to teach spatial data analysis and explore geographic uncertainties. *Journal of Geography in Higher Education* 00, 1–11. <https://doi.org/10.1080/03098265.2021.1901076>
- 6) **Hilgendorf, Z.**, Marvin, M.C.\*, Turner, C.M., Walker, I.J., 2021. Assessing geomorphic change in restored coastal dune ecosystems using a multi-platform aerial approach. *Remote Sensing* 13, 354. <https://doi.org/10.3390/rs13030354>

- 7) **Hilgendorf, Z.**, Wells, G., Larson, P.H., Millett, J., Kohout, M., 2020. From basins to rivers: Understanding the revitalization and significance of top-down drainage integration mechanisms in drainage basin evolution. *Geomorphology* 352, 107020.  
<https://doi.org/10.1016/j.geomorph.2019.107020>

#### CONFERENCE PRESENTATIONS (\* Denotes undergraduate student collaborator)

- 1) Claas, L. \*, **Hilgendorf, Z.**, Wood, J., Brown, A., Larson P.H., Wickert, A., 2023. From Environmental Catastrophe to Soil Conservation Practices: Investigating Historic Land Use/Land Cover (LULC) Change in the Whitewater River Basin, Southeastern Minnesota, in: 2023 West Lakes Divisional Meeting of the American Association of Geographers, Chicago, IL, October 20-21, 2023. Oral presentation.
- 2) **Hilgendorf, Z.**, Walker, I.J., 2023. Quantifying nebkha growth and development: Case study from the Oceano Dunes nature-based restoration project, in: International Conference on Aeolian Research XI, Las Cruces, NM, July 10-14, 2023. Oral presentation.
- 3) Walker, I.J., **Hilgendorf, Z.**, Swet, N., 2023. Foredune restoration as a dust control measure, Oceano Dunes, California, USA, in: International Conference on Aeolian Research XI, Las Cruces, NM, July 10-14, 2023. Oral presentation.
- 4) Claas, L. \*, **Hilgendorf, Z.**, 2023. Historic land use/ land cover (LULC) change assessment following watershed degradation in the Whitewater River basin, southeastern Minnesota, USA, in: National Conference on Undergraduate Research, Eau Claire, WI, April 13-15, 2023. Poster presentation.
- 5) **Hilgendorf, Z.**, Walker, I.J., Pickart, A.J., 2023. Dynamic restoration and the impact of invasive vegetation on coastal foredune resilience: Seven years of change at the Lanphere Dunes, CA, USA, in: American Association of Geographers Annual Meeting, Denver, CO, March 23-27, 2023. Oral presentation.
- 6) Pickart, A.J., **Hilgendorf, Z.**, Walker, I.J., 2023. Increased climate resilience following restoration of a California foredune, in United States Fish & Wildlife Service 2023 Pacific Coast Dunes Restoration Meeting, Virtual, 1-3 February, 2023. Oral presentation.
- 7) Walker, I.J., **Hilgendorf, Z.**, Swet, N., 2023. Foredune restoration as a dust control measure at the Oceano Dunes, California, in United States Fish & Wildlife Service 2023 Pacific Coast Dunes Restoration Meeting, Virtual, 1-3 February, 2023. Oral presentation.
- 8) Furtak-Cole, E. Gilles, J.A., **Hilgendorf, Z.**, Nikolich, G., Walker, I.J., 2023. Simulation of atmospheric flow and shear stress over six coastal dune restoration treatments, in: American Meteorological Society Annual Meeting 2023, Denver, CO, January 8-12, 2023. Oral presentation.
- 9) Walker, I.J., **Hilgendorf, Z.**, 2021. Understanding foredune morphodynamics and resilience in response to dynamic restoration [invited], in Coastal dune resilience workshop - Center for Climate Change Impacts and Adaptation, California Sea Grant, Scripps Institute, Virtual, 8-9 December, 2021. Oral presentation.

- 10) Furtak-Cole, E., Gillies, J.A., Walker, I.J., **Hilgendorf, Z.**, 2021. Computational and experimental investigation of the shear stress on a coastal foredune, in: 74<sup>th</sup> Annual Meeting of the APS Division of Fluid Dynamics. Bulletin of the American Physical Society, Phoenix, AZ. November 21-23, 2021. Poster presentation.
- 11) **Hilgendorf, Z.**, Walker, I.J., Pickart, A.J., Rader, A.M., Bauer, B.O., Hesp, P.A., 2020. Assessing geomorphic and sediment budget responses to foredune vegetation restoration using close-range remote sensing, in: American Association of Geographers Annual Meeting, Virtual, April 6-10, 2020. Oral presentation.
- 12) **Hilgendorf, Z.**, Walker, I.J., Pickart, A.J., 2019. Recovery of foredunes by aeolian rebuilding following the 2015-16 El Niño, Lanphere Dunes, California, USA., in: Geological Society of America Annual Meeting, Phoenix, AZ. September 21-24, 2019. Poster presentation.
- 13) Faulkner, D.J., Larson, P.H., Adams, H., Kuehl, K., **Hilgendorf, Z.**, Jol, H.M., Running, G.L., 2019. The Chippewa River: Paragon of a Paraglacial Fluvial System, in: American Association of Geographers Annual Meeting, Washington, D.C., April 3-8, 2019. Oral presentation.
- 14) Hoppie, B.W., **Hilgendorf, Z.**, Matteson, S., 2017. Sediment and nutrient fluxes through a small surge pond in a Midwestern watershed dominated by row crop production, in: American Geophysical Union Fall Meeting, New Orleans, LA. December 11-15, 2017. Oral presentation.
- 15) **Hilgendorf, Z.**, Moore, R., Kohout, M.A., Salfer, J.T., Libby, D., Larson, P.H., Richards, M., Batzlaff, B., 2017. Refining and evaluating a method of hydro-modification of LiDAR derived DEMs in agricultural land-use dominated watersheds. County Ditch 57 watershed, Minnesota, USA., in: American Association of Geographers Annual Meeting, Boston, MA, April 5-9, 2017. Poster presentation.
- 16) **Hilgendorf, Z.**, 2016. Implementing GIS Methods in intensively altered agricultural drainage basins: Examining County Ditch 57 in Mapleton, MN as a case study, in: Minnesota State University-Mankato Annual GIS Day, Mankato, MN. November 16, 2016. Poster presentation.
- 17) Yuan, F., Mulvihill, R., Larson, P.H., Libby, D., **Hilgendorf, Z.**, 2016. Mapping and analyzing stream network changes in Watonwan River watershed, in: Minnesota GIS/LIS Consortium 26th Annual Conference and Workshops, Duluth, MN. October 26-28, 2016. Poster presentation.
- 18) **Hilgendorf, Z.**, Larson, P.H., Hoppie, B.W., 2016. Analysis of nonpoint source pollution mitigation strategies within an agricultural watershed: Cobb River watershed, Minnesota River Basin, south-central Minnesota - Preliminary Results, in: American Association of Geographers Annual Meeting, San Francisco, CA, March 29-April 2, 2016. Poster presentation.

- 19) Libby, D., Larson, P.H., **Hilgendorf, Z.**, Williams, V.A., Chadwick-Camp, M., Howell, D.W., Aeikens, A.L., Scheeler, D.J., Millett, J.J.F., Rothmeier, K.P., 2016. Assessing Error and Uncertainty in Remote Analysis of Channel Change Dynamics and Morphology. Case Study: Minnesota River, Minnesota, USA., in: American Association of Geographers Annual Meeting, San Francisco, CA, March 29-April 2, 2016. Poster presentation.
- 20) **Hilgendorf, Z.**, Larson, P.H., Hoppie, B.W., 2015. County Ditch 57: Understanding the implications of intensive agricultural practices within first-order drainages and their effects on the larger system, in: American Association of Geographers West Lakes Regional Meeting, Eau Claire, WI. October 15-17, 2015. Oral presentation.
- 21) **Hilgendorf, Z.**, Jol, H.M., Loope, W.L., Morrison, S.M., 2015. Low frequency (50, 100, 200 MHz) ground penetrating radar analysis of the Nipissing beach ridge, Huron Mountains, MI, in: Geological Society of America North-Central Section 49th Annual Meeting. Geological Society of America, p. 29. Poster presentation.
- 22) **Hilgendorf, Z.**, Faulkner, D.J., 2015. The Extent of tributary incision in response to knickpoint migration on the Chippewa River in west-central Wisconsin, in: Celebration of Excellence in Research and Creative Activities, Eau Claire, WI. April 29-30, 2015. Poster presentation.
- 23) **Hilgendorf, Z.**, Faulkner, D.J., 2015. Knickpoint Migration on the Lower Chippewa River in West-Central, in: American Association of Geographers Annual Meeting, Chicago, IL, April 21-25, 2015. Poster presentation.
- 24) Brueske, M., Adams, H., Anderson, N., Dorn, D., Hegg, M., **Hilgendorf, Z.**, Krantz, A., Kroening, C., Morrison, S.M., Thompson, P., Running, G.L., 2015. Planning Community Gardens: Soils and Slopes at the Priory, UW-Eau Claire, Wisconsin, in: American Association of Geographers Annual Meeting, Chicago, IL, April 21-25, 2015. Poster presentation.

**NON-REFEREED PUBLICATIONS AND REPORTS (\* denotes undergraduate collaborator)**

- 1) Swet, N., **Hilgendorf, Z.**, Walker, I.J., 2022. UCSB Historical Vegetation Cover Change Analysis (1930-2020) within the Ocean Dunes SVRA. Technical report to the Oceano Dunes Scientific Advisory Group (SAG) and the State of California Department of Parks and Recreation, OHV Division.. 86 p.
- 2) **Hilgendorf, Z.**, Walker, I.J., Turner, C.T., 2021. UCSB-ASU 2020-2021 ODSVRA Foredune restoration survey report. Research report to the Oceano Dunes Scientific Advisory Group (SAG) and the State of California Department of Parks and Recreation. 38 p.
- 3) Marvin, M.C.\*, **Hilgendorf, Z.**, Walker, I.J., 2020. Eel River Estuary Preserve foredune reconstruction project 2018-2019 SfM-MVS campaign update. Technical report for the Humboldt Coastal Resilience Project (HCRP) (Grant# 18-073) to the California State Coastal Conservancy, USC Sea Grant, and California Ocean Protection Council. 9 p.
- 4) Shinsato, L., **Hilgendorf, Z.**, Walker, I.J., 2019. Humboldt Bay Vulnerability Assessment Preliminary Status Report. Technical report for the Humboldt Coastal Resilience Project

(HCRP) (Grant # 18-073) to the California State Coastal Conservancy, USC Sea Grant, and California Ocean Protection Council. 11 p.

- 5) **Hilgendorf, Z.**, Walker, I.J., 2019. 2015-2019 TLS Campaign Update. Technical report for the Humboldt Coastal Resilience Project (HCRP) (Grant # 18-073) to the California State Coastal Conservancy, USC Sea Grant, and California Ocean Protection Council. 19 p.

## FUNDING

<i>In Review</i>	\$4,278	<i>University of Wisconsin-Eau Claire Student-Faculty Research Collaboration for "Assessing Cross-Shore Profiles and Vegetation Communities for Understanding Risks for Coastal Communities, Humboldt Bay, CA, USA." Liam McClellan, Alyssa Valk, Reed Ziemer, student research collaborators.</i>
<i>In Review</i>	\$2,285	<i>University of Wisconsin-Eau Claire Student-Faculty Research Collaboration for "Examining the impact of historic land use change on watershed evolution, Whitewater River watershed, southeastern MN." Julie Ann Seidling Schummer, student research collaborator.</i>
2022	\$2,384	University of Wisconsin-Eau Claire Student-Faculty Research Collaboration for "Historic Land Use and Land Cover Change in the Whitewater River watershed, southeastern MN." Lauren Claas, student research collaborator.
2020	\$1,700	Melvin G. Marcus Memorial Fellowship Geographical Sciences and Urban Planning, Arizona State University
2018	\$1,000	John F. Lounsbury Travel Fellowship Geographical Sciences and Urban Planning, Arizona State University
2017	\$1,750	George J. Miller Field Studies Endowment Department of Geography, Minnesota State University, Mankato
2016	\$5,000	James F. Goff Graduate Research Endowment Department of Geography, Minnesota State University, Mankato
2014-2015	\$2,160	Summer Research Experience for Undergraduates Department of Geography and Anthropology, University of Wisconsin-Eau Claire

## ACADEMIC HONORS AND AWARDS

2020	Graduate Student Service Award Geographical Sciences and Urban Planning, Arizona State University
2020	Norbert P. Psuty Student Paper Merit Award Recipient American Association of Geographers Coastal and Marine Specialty Group
2015	Masters Student Research Paper Presentation 1 <sup>st</sup> Place American Association of Geographers-West Lakes Regional Meeting

- 2015 Recognition of Research Excellence in Geography  
Department of Geography and Anthropology, University of Wisconsin-Eau Claire
- 2014- Michael F. Friedrich Science Scholarship Recipient  
2015 University of Wisconsin-Eau Claire
- 2014 Kerlin and Ethel Seitz Scholarship  
Department of Geography and Anthropology, University of Wisconsin-Eau Claire
- 2014 Craig Wickman Applied GIS Scholarship  
Department of Geography and Anthropology, University of Wisconsin-Eau Claire

### INVITED TALKS

- 1) University of Wisconsin-Eau Claire Earth Science Seminar Series (2022).  
Title: "Restoring Natural Systems: How do you plan, monitor, and assess restoration of dynamic landscapes?"
- 2) Minnesota State University-Mankato Department of Geography Colloquium (2022)  
Title: "Restoring Natural Systems: How do you plan, monitor, and assess restoration of dynamic landscapes?"
- 3) Humboldt Coastal Dunes Cooperative Annual Public Meeting (2020)  
Title: "Humboldt Coastal Resilience Project Updates: How is vegetation shaping the Lanphere Dunes?"
- 4) Humboldt Bay Friends of the Dunes Coastal Naturalist Training (2020)  
Title: "Understanding foredune change in response to native replanting at the Lanphere Dune Unit, Humboldt Bay, California"
- 5) Humboldt Bay Dunes Retreat Program (2019)  
Title: "Update on the Lanphere Dunes Dynamic Restoration Project" (Guided Site Visit)
- 6) Le Sueur River Watershed Network Public Meeting (2017)  
Title: "The efficacy of best management practices on peak discharge and contaminant loads in agricultural drainage systems, Blue Earth River watershed, south-central Minnesota, USA"

### PROFESSIONAL ASSOCIATION MEMBERSHIPS

- 2017-present American Geophysical Union (AGU)
- 2016-present Gamma Theta Upsilon International Honors Society (GTU)
- 2014-present Geological Society of America (GSA)
- 2014-present American Association of Geographers (AAG)

### SERVICE ACTIVITIES

- 2022-present Reviewer - *Earth Surface Processes and Landforms*

- 2022-present    Reviewer – *Geomorphology*
- 2020-present    Reviewer - *Geosciences Journal*
- 2018-2021        Travel Grant Reviewer  
Graduate and Student Professional Association, Arizona State University
- 2018-2021        Research Grant Reviewer  
Graduate and Student Professional Association, Arizona State University
- 2019-2021        Volunteer – PhD Visit Day  
Geographical Sciences and Urban Planning, Arizona State University
- 2018-2019        Graduate Student Council  
Geographical Sciences and Urban Planning, Arizona State University
- 2017-2018        Moderator  
National Geographic Bee, Minnesota State
- 2018-2021        Co-Advisor,  
Theta Chapter, Gamma Theta Upsilon International Honors Society
- 2018-2019        Chair for Ad Hoc Committee to Revise Initiation Ceremony  
Gamma Theta Upsilon International Honors Society
- 2017-2022        Student Outreach Assistant  
Gamma Theta Upsilon International Honors Society
- 2017-2022        Awards Committee Member  
Gamma Theta Upsilon International Honors Society



**Professional References:**

**Dr. Ian Walker (PhD Supervisor)**

Department of Geography  
University of California, Santa Barbara  
4834 Ellison Hall  
Santa Barbara, CA 93106-4060  
Email: [ianjwalker@ucsb.edu](mailto:ianjwalker@ucsb.edu)

**Dr. Phillip Larson (M.S. Supervisor)**

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Minnesota State University-Mankato  
Morris Hall 222G  
Mankato, MN 56001  
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**Dr. Ronald Dorn (PhD Committee Member)**

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