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### Education

## Ph.D. 2004 Washington State University Geology

## M.S. 1999 University of Nebraska-Lincoln Geosciences

## B.S. 1997 University of Nebraska-Lincoln Geology

### Experience

University of South Dakota Professor 2018-present

University of South Dakota Associate Professor 2012-2018

University of South Dakota Assistant Professor 2006-2012

Desert Research Institute Post-Doctoral Research Associate 2004-2006

### Awards & Recognitions

* 2017, University of South Dakota College of Arts & Sciences Richard and Sharon Cutler Award in Liberal Arts (Science and Math Division)
* 2009, Geological Society of America Gladys W. Cole Memorial Research Award, “Late

Holocene geomorphic response of Kelso Wash, eastern Mojave Desert: climatic versus base level control of a desert dust source.”

### Teaching Experience

* Dynamic Earth (ESCI 101, 4 cr), taught every other Fall semester
* Earth & Life Through Time (ESCI 103, 4 cr), taught every Spring semester
* National Parks and Monuments (ESCI 201, 2 cr), *no longer offered*
* Environmental Earth Science (ESCI 205, 3 cr), *no longer offered*
* Conducted Field Trip (ESCI 396, 1-2 cr), to Death Valley, last taught 2018
* Principles of Geomorphology & Lab (ESCI 411/511, 3 cr), last taught 2018
* Global Climate Change (ESCI 416/516, 3 cr), taught every 2 years
* Introduction to River Studies (ESCI 442, 3 cr), co-taught every 2 years
* Principles of Sedimentology & Lab (ESCI 443, 4 cr), *no longer offered*
* Fundamentals of Hydrogeology (ESCI 473/573, 3 cr), last taught 2016
* Soil & Landscape (ESCI/SUST 421/521, 3 cr), last taught Fall 2023
* Capstone Course in Earth Sciences (ESCI 495, 1 cr), *no longer offered*
* The Future of Water (UHON 390, 3 cr), honors course, Spring 2018
* Sustainability Seminar (SUST 790, 1 cr), graduate seminar, Fall 2023
* Innovating for Change (SUST 810, 3 cr), last taught Spring 2023

## *Grants Received*

* 2023-2024, “Dust production via abrasion of basalt sand: An analog for Mars,” South Dakota Space Grant Consortium, $3,750.
* 2020-2025, “Collaborative Research: Network Cluster: Dust in the Critical Zone from the Great Basin to the Rocky Mountains,” National Science Foundation, 2011910, PI: Kevin Perry (Univ. Utah), USD Subaward $97,004.
* 2020-2023, “Developing Technologies to Remotely Predict Climate and Terrain Controls on Soil-Surface boundary Processes to Enhance Military Planning and Operations,” subaward from Desert Research Institute, $98,203.
* 2019-2021, “Testing the feasibility of critical terrain condition prediction for military planning and operations using soil-landscape system features and related climatic parameters,” subaward from Desert Research Institute, $66,261.
* 2018-2021, “Evaluating post-flood sandbar succession and species biodiversity related to listed species habitat”, National Park Service, PIs: M. Dixon, D. Swanson and M. Sweeney, $299,996.
* 2017-2022, “Land surface processes, dust sources and particulate fluxes for the 1930s Dust Bowl Drought area, Great Plains, USA”, National Science Foundation, Geography and Spatial Sciences, PI: Steve Forman (Baylor U.), $220,033, USD subaward years 2-3: $44,788.
* 2016-2019, “Modeling linkages among soil-terrain-atmospheric processes critical for military operations”, subaward from Desert Research Institute, $25,735.
* 2015-2016, "Characterization of sediment sources in the Lewis and Clark Lake Delta", Missouri Sedimentation Action Coalition, PI: M. Sweeney, $21,057.
* 2015-2016, "Sustainable Rivers: Integrating Earth Science & Sustainability Across the Curriculum", National Science Foundation InTeGrate subaward, PIs: M. Sweeney, M. Jarchow, $43,620.
* 2015, University of South Dakota College of Arts & Science Travel Grant, $700.
* 2011-2013, “Lewis and Clark Lake Sediment Accumulation Illustration Project”, Missouri Sediment Action Coalition, PI: T. Cowman, Co-PIs: M. Dixon and M. Sweeney, $15,627.
* 2011-2012, “Acquisition of a Portable In Situ Wind Erosion Lab (PI-SWERL) for research in Earth Sciences”, National Science Foundation Instrumentation & Facilities (EAR-1029116), PI: M. Sweeney, $53,500.
* 2011: “Collaborative Research: Mechanisms Producing Variation in Lake Salinity in Dune Environments: Nebraska” National Science Foundation subaward (EAR-0609982), $11,110.
* 2009-2011, “Collaborative Research: Linking loess landforms and eolian processes”, National Science Foundation Geomorphology and Land Use Dynamics (EAR-0921915), PIs: J. Mason, M. Sweeney, P. Hanson, $135,070, USD portion $50,761.
* 2008, University of South Dakota Bush Travel Grant, $483.
* 2006-2010, “Where does dust originate? Geomorphic and climatic control on the evolution of dust sources in the Mojave Desert, USA”, National Science Foundation Geomorphology and Land Use Dynamics (EAR-0736125), PIs: M. Sweeney and E. McDonald, $80,165.
* 2006, University of South Dakota Office of Research Travel Grant, $500.
* 2006, State of California Department of Water Resources, Ecosystem Restoration of the Salton Sea, “Playa analogs to the Salton Sea”, PI: Mark Sweeney, $72,000.
* 2004-2007, State of California Department of Water Resources, Ecosystem Restoration of the Salton Sea, “Measurement of windblown dust emission potential and soil characterization at the Salton Sea”, PIs: Vic Etyemezian, John Gillies, Eric McDonald, Mark Sweeney, Contract 4600003670, $286,061.
* 2002-2005, “Paleoclimatology and geochronology of a late Quaternary eolian system, Columbia Plateau, U.S.A.”, National Science Foundation Doctoral Dissertation Research Improvement Grant (BCS-0202096), PI: Mark Sweeney, $11,800.

## *Peer-reviewed Publications (\* = undergraduate student; ^ = graduate student)*

**Sweeney, M.R., \***Lacey, T., Forman, S.L., 2023, The role of abrasion and resident fines in dust

production from aeolian sands as measured by the Portable in situ Wind Erosion Laboratory (PI-SWERL. Aeolian Research, v. 63-65, <https://doi.org/10.1016/j.aeolia.2023.100889>

**Sweeney, M.R.**, Forman, S.L., and McDonald, E.V., 2022, Contemporary and future dust sources

and emission fluxes from gypsum- and quartz-dominated eolian systems, New Mexico and Texas, USA. Geology, v. 50, p. 356-360, doi:10.1130/G49488.1/5481683/g49488

**Sweeney, M.R.,** \*Chabela, L.P., McDonald, E.V., and Hanson, P.R., 2022, Eolian-fluvial

interactions at the Kelso Dunes, Mojave National Preserve, in Miller, D.M. (Ed.), 2022 Desert Symposium Field Guide and Proceedings, p. 103-106.

**Sweeney, M.R.**, 2022, Dust emission processes, *in* Schroder, J.J.F. (Ed.), Treatise on

Geomorphology 2nd ed., v. 7, Elsevier, Academic Press, p. 235-258.

doi:10.1016/B978-0-12-818234-5.00015-8.

Beall, C.C., Dixon, M.D., Illeperuma, N.D., **Sweeney, M.R.**, and Johnson, W.C., 2021, Expansion

of woody vegetation on a Missouri River reservoir delta-backwater. Ecohydrolology, e2357, doi:10.1002/eco.2357

Jurotich\*, M., Cardona\*, N., Vazquez\*, B., Wetzel\*, R., Cowman, C., and **Sweeney, M.**, 2021,

Contributions of suspended load from Missouri River tributaries, southeast South Dakota, and northeast Nebraska: Building a sediment budget. River Research and Applications, v. 37, p. 511-521, doi:10.1002/rra.3767.

**Sweeney, M.R.**, McDonald, E.V., \*Chabela, L.P., Hanson, P.R., 2020, The role of eolian-fluvial

interactions and dune dams in landscape change, late Pleistocene-Holocene, Mojave Desert, USA. Geological Society of America Bulletin, v. 132, p. 2318-2332, doi:10.1130/B35434.1

Cui, M., Lu, H., Wiggs, G.F.S., Etyemezian, V., **Sweeney, M.R.**, Xu, Z., 2019, Quantifying the

effect of geomorphology on aeolian dust emission potential in northern China. Earth Surface Processes and Landforms, v. 44, p. 2872-2884, doi:10.1002/esp.4714.

Bolles, K.^, **Sweeney, M.**, Forman, S., 2019, Meteorological catalysts of dust events and particle

source dynamics of affected soils during the 1930s Dust Bowl drought, Southern High Plains, USA. Anthropocene, v. 27, p. 1-23, doi:10.1016/j.ancene.2019.100216.

**Sweeney, M.R.**, \*Fischer, B., \*Wormers, K., Cowman, T., 2019, Eolian and fluvial

modification of Missouri River sandbars deposited by the 2011 flood, USA. Geomorphology, v. 327, p. 111-125. doi:10.1016/j.geomorph.2018.10.018

Lechler, A.R., Huntington, K.W., Breecker, D.O., **Sweeney, M.R.**, Schauer, A.J., 2018, Loess-

paleosol carbonate clumped isotope record of late Pleistocene-Holocene climate change in the Palouse region, Washington State, USA. Quaternary Research, v. 90, p. 331-347. doi:10.1017/qua.2018.47

**Sweeney, M.R.**, McDonald, E.V., Gaylord, D.R., 2017, Generation of the Palouse loess: Exploring

the linkages between glaciation, outburst megafloods, and eolian deposition in Washington State. Geological Society of America Field Guide 49. doi:10.1130/2017.0049

Bolles, K.^, Forman, S.L., **Sweeney, M.R.**, 2017, Eolian processes and heterogeneous dust

emissivity during the 1930s Dust Bowl Drought and implications for projected 21st century megadroughts. The Holocene, v. 27(10), p. 1578-1588. doi:10.117/0959683617702235

King, G.E., Pearce, N.J.G., Roberts, H.M., Smith, V.C., Westgate, J.A., Gaylord, D.R., **Sweeney,**

**M.R.**, 2016, Identification of a Kulshan caldera correlative tephra in the Palouse loess of Washington State, northwest USA. Quaternary Research, v. 86, p. 232-241.

**Sweeney, M.R.,** Zlotnik, V.A., Joeckel, R.M., Stout, J.E., 2016, Geomorphic and hydrologic

controls of dust emissions during drought from Yellow Lake playa, West Texas, USA. Journal of Arid Environments, v. 133, p. 37-46. doi:10.1016/j.aridenv.2016.05.007

**Sweeney, M.R.**, Lu, H., Cui, M., Mason, J.A., Feng, H., Xu, Z., 2016, Sand dunes as potential

sources of dust in northern China. Science China Earth Sciences, v. 59, p. 760-769. doi: 10.1007/s11430-015-5246-8.

Baker, V.R., Bjornstad, B.N., Gaylord, D.R., Smith, G.A., Meyer, S.E., Ahlo, P., Breckenridge,

R.M., **Sweeney, M.R.,** Zreda, M., 2016, Pleistocene megaflood landscapes of the Channeled Scabland. In Lewis, R.S., and Schmidt, K.I, eds., Exploring the Geology of the Inland Northwest: Geological Society of America Field Guide 41, p. 1-73.

Ujvari, G., Stevens, T., Svensson, A., Klotzli, U., Manning, C., Nemeth, T., Kovacs, J., **Sweeney,**

**M.**, Gocke, M., Wiesenberg, G., Markovic, S., Zech, M., 2015, Two possible source regions for central Greenland last glacial dust. Geophysical Research Letters, v. 42(23), p. 10,399-10,408.

Cui, M., Lu, H., **Sweeney, M.**, Mason, J., Feng, H., Xu, Z., 2015, PM10 emission flux in the

Tengger Desert and Mu Us sand field, northern China, measured by PI-SWERL (in Chinese). Chinese Science Bulletin, v. 60, p. 1-10.

**Sweeney, M. R.,** Mason, J.A., 2013, Mechanisms of dust emission from Pleistocene loess

deposits, Nebraska, USA. Journal of Geophysical Research – Earth Surface, 118, doi:10.1002/jgrf.20101.

**Sweeney, M. R.,** McDonald, E. V., Markley\*, C.E., 2013, Alluvial sediment or playas: what is the

dominant source of sand and silt in desert soil Av horizons, southwest USA. Journal of Geophysical Research – Earth Surface, 118, doi:10.1002/jgrf.20030.

McDonald, E.V., **Sweeney, M.R.,** Busacca, A.J., 2012, Glacial outburst floods and loess

sedimentation documented during oxygen isotope stage 4 on the Columbia Plateau, Washington State. Quaternary Science Reviews, v. 45, p. 18-30.

Loope, D.B., Elder, J.F., **Sweeney, M**, 2012, Downslope coarsening in aeolian grainflows of

the Navajo Sandstone. Sedimentary Geology, v. 256-257, p. 156-162.

**Sweeney, M.R.,** McDonald, E.V., Etyemezian, V., 2011*,* Quantifying dust emissions from

desert landforms, eastern Mojave Desert, USA. Geomorphology, v. 135, p. 21-34.

King, J., Etyemezian, V., **Sweeney, M.**, Buck, B., Nikolich, G., 2011, Dust emission variability

at the Salton Sea, California. Aeolian Research, v. 3, p. 67-79.

Kavouras, I. G., Etyemezian, V., Nikolich, G., Gillies, J, **Sweeney, M.**, Young, M., and

Shafer, D., 2009, A new technique for characterizing the efficacy of fugitive dust suppressants. Journal of Air and Waste Management, v. 59, p. 603-612.

**Sweeney, M.,** V. Etyemezian, T. Macpherson, W. Nickling, J. Gillies, G. Nikolich, and E.

McDonald, 2008, Comparison of PI-SWERL with dust emission measurements from a straight-line field wind tunnel, Journal of Geophysical Research, 113, F01012, doi:10.1029/2007JF000830.

**Sweeney, M. R.**, Gaylord, D. G., and Busacca, A. J., 2007, Eureka Flat: a long-term dust-

production engine of the Palouse loess, Pacific Northwest, USA. Quaternary International, v. 162-163, p. 76-96.

Etyemezian, V., Nikolich, G., Ahonen, S., Pitchford, M., **Sweeney, M.**, Purcell, R., Gillies, J., and

Kuhns, H., 2007, The Portable In-Situ Wind Erosion Laboratory (PI-SWERL): A new method to measure PM10 windblown dust properties and potential for emissions. Atmospheric Environment, v. 41, p. 3789-3796.

**Sweeney, M. R.**, Busacca, A. J., and Gaylord, D. R., 2005, Topographic and climatic influences on

accelerated loess accumulation since the last glacial maximum in the Palouse, Pacific Northwest, USA. Quaternary Research, v. 63, p. 263-275.

Dashzeveg, D., Dingus, L., Loope, D., Swisher, C., Dulam, T., and **Sweeney, M.**, 2005*,* New stratigraphic subdivision, depositional environment, and age estimate for the Upper Cretaceous Djadokhta Formation, Southern Ulan Nur Basin, Mongolia. American Museum Novitates, no. 3498, 31 pp.

**Sweeney, M.R.**, Busacca, A.J., Richardson, C.A., Blinnikov, M.S., and McDonald, E.V., 2004,

Glacial anticyclone recorded in Palouse loess of northwestern USA. Geology, v. 32, p. 705-708.

Busacca, A. J., and **Sweeney, M. R.,** 2004. Loess. *In*: Hillel, D., ed., Encyclopedia of Soils in the

Environment. Academic Press, p. 364-373.

Gaylord, D.R., Busacca, A.J., and **Sweeney, M.R.**, 2003, The Palouse loess and the Channeled

Scabland: a paired Ice-Age geologic system. In: Easterbrook, D., ed., XVI INQUA Congress Field Trip Guidebook, p. 123-134.

Busacca, A.J., Muhs, D., Markowich, H., Beget, J., Lancaster, N., and **Sweeney, M.R.**, 2003,

Eolian Sediments. *In*: Gillespie, A. C., Porter, S. C., and Atwater, B. F., eds., The Quaternary Period in the United States. Elsevier Press, New York, p. 275-310.

**Sweeney, M. R.**, and Loope, D. B., 2001, Holocene dune-sourced alluvial fans in the

Nebraska Sand Hills. Geomorphology, v. 38, p. 31-46.

## *Non-peer Reviewed* *Papers, Technical Reports, and Websites*

**Sweeney, M.,** Haiar\*, J., 2017, Credible sources and science literacy: the role of social media.

In The Trenches, v. 7, no. 2, p. 6-8.

**Sweeney, M.,** Cowman, T., Dixon, M., and Wesner, J., 2016, Characterization of the

geomorphology, sediment sources, vegetation, and macroinvertebrate diversity of the Lewis and Clark Lake delta. Prepared for the Missouri Sedimentation Action Coalition, Nov. 20, 2016, 53p.

**Sweeney, M.**, Jarchow, M., 2016, Using the Missouri River to integrate science and

sustainability across the curriculum. In The Trenches, v. 6, no. 3, p. 5-6.

**Sweeney, M.,** Jarchow, M., 2016, Sustainable Rivers: Integrating Earth Science and

Sustainability Across the Curriculum. <https://serc.carleton.edu/integrate/programs/implementation/southdakota/index.html>

**Sweeney, M.,** 2008, Eureka Flat: How glacial outburst floods started the dust engine of the

Pacific Northwest. For: Key Concepts in Geomorphology, textbook accompanied by on-line content. <http://serc.carleton.edu/vignettes/collection/25469.html>

**Sweeney M. R.,** McDonald, E., Etyemezian, V., Caldwell, T., Bacon, S., Baker, S., DuBois, D., and

King, J., 2007,Assessment of potential playa and lake analogues to the Salton Sea in support of the Programmatic Environmental Impact Report. Prepared for the California Department of Water Resources, Feb. 23, 2007, 60p.

Etyemezian, V., **Sweeney, M.,** McDonald, E., Caldwell, T., Gillies, J., Nikolich, G., and Xu, J., 2006,

Measurement of windblown dust emission potential and soil characteristics at the Salton Sea in support of the Programmatic Environmental Impact Report: Final Report. Prepared for the California Department of Water Resources, Aug. 18, 2006, 177p.

Etyemezian, V., Ahonen, S., Gillies, J., Goreham, J., Kavouras, I., Nikolich, G., Shafer, D.,

**Sweeney, M.,** and Young, M., 2006, Plutonium soil stabilization study at the Nevada Test Site: Final Report. Prepared for Encapco Technologies LLC and Naval Facilities Engineering Service Center, Mar. 17, 2006, 185p.

***Abstracts (Since 2012; \* = undergraduate student; ^ = graduate student)***

**Sweeney, M.**, Bustos, D., Martinez, P., ^Harsha, G., Chadima, S., Hand., J., Gill, T., 2023, The role

of efflorescent salts in dust production at White Sands National Park, New Mexico. Geological Society of America Abstracts with Programs, v. 55, no. 6, doi:10.1130/abs/2023AM-393365.

**Sweeney, M.,** Forman, S., Weeden, T., 2023, Dust emission potential of South Dakota soils:

Insight into the 1930s Dust Bowl Drought. Proceedings of the South Dakota Academy of Science, Vol. 102.

**Sweeney, M.,** ^Nwanevu, C., 2023, Key to success of campus recycling programs. Upper

Midwest Conference on Sustainability, 22-23 September, Vermillion, SD.

**Sweeney, M.**, Bustos, D., Martinez, P., ^Harsha, G., Chadima, S., 2023, Dust emission processes

on Alkali Flat and Lake Lucero, White Sands National Park, New Mexico. International Conference on Aeolian Research, 9-14 July, Las Cruces, NM.

^Harsha, G., **Sweeney, M.,** McDonald, E., 2023, A field-based evaluation of the Preferential Dust

Source Scheme in the northern Chihuahuan Desert. International Conference on Aeolian Research, 9-14 July, Las Cruces, NM.

^Hartshorn, E., **Sweeney, M.,** McDonald, E., Sion, B., 2023, Integrating sub-centimeter

resolution photogrammetry with a surface roughness correction factor applied to PI-SWERL measurements. International Conference on Aeolian Research, 9-14 July, Las Cruces, NM.

**Sweeney, M.** and Forman, S., 2022, Contrasting dust emission processes in the Northern and

Southern Great Plains, USA. Geological Society of America Abstracts with Programs, v.

54, no. 5, doi:10.1130/abs/2022AM-380646.  
\*Wiebelhaus, W. and **Sweeney, M.**, 2022, Kicking up dust on Utah’s off-road vehicle trails: PI-

SWERL assessment of anthropogenic dust emissions. Geological Society of America

Abstracts with Programs, v. 54, no. 5, doi:10.1130/abs/2022AM-380637.  
Fisher, K.R., Ewing, R.C., and **Sweeney, M.**, 2022, Erodibility of microbial mats and the

implications for preservation of microbially induced sedimentary structures (MISS).

Abstract 2147, 53rd Lunar and Planetary Science Conference, March 7-11, 2022, Houston, TX.

^Harsha, G., **Sweeney, M.**, McDonald, E., 2021, Testing the Preferential Dust Source scheme

using the PI-SWERL in the northern Chihuahuan Desert, New Mexico and Texas. Geological Society of America Abstracts with Programs, v. 53, no. 6, doi: 10.1130/abs/2021AM-370249

**Sweeney, M.**, Forman, S., McDonald, E., 2021, Comparing dust emission processes and dust

fluxes from dune fields and associated landforms. Geological Society of America Abstracts with Programs, v. 53, no. 6, doi: 10.1130/abs/2021AM-367379.

^Weeden, T., Forman, S., **Sweeney, M.**, 2021, Evidence for a northern Dust Bowl: Heightened

wind erosion and dust sources during the 1930s in the northern Great Plains, USA. Geological Society of America Abstracts with Programs, v. 53, no. 6, doi: 10.1130/abs/2021AM-370102.

Cui, M., Lu, H., Wiggs, G., Etyemezian, V., **Sweeney, M.**, Xu, Z., 2019, Quantifying the effect of

geomorphology on aeolian dust emission potential in northern China. American Geophysical Union Annual Meeting, Dec. 9-13, San Francisco, CA.

**Sweeney, M.R.**, McDonald, E.V., Chabela, L.P., Hanson, P.R., 2019, The role of eolian-fluvial

interactions and dune dams in alluvial fan and ephemeral wash dynamics, late Pleistocene-Holocene, Mojave Desert, USA. Geological Society of America Abstracts with Programs, v. 51.

**Sweeney, M.R.**, Forman, S., McDonald, E., 2019, A tale of two dune fields: dust emission

processes from White Sands, New Mexico and Monahans, Texas, USA (Invited Presentation). 20th Congress of the International Quaternary Association (INQUA) meeting, Dublin, Ireland, July 25-31, 2019.

\*Cardona, N., **Sweeney, M**., 2019, Suspended sediment contributions of Nebraska tributaries

along the 59-mile stretch of the Missouri National Recreational River. SD EPSCoR Undergraduate Research Symposium, July 30, 2019, Sioux Falls, SD.

Bolles, K., Forman, S.L., **Sweeney, M.**, Crooks, J., 2018, Estimating health risks to dust aerosol

exposure at the heart of the 1930s Dust Bowl, Southern Great Plains, USA. American Geophysical Union Annual Meeting, Dec. 10-14, 2018, Washington, D.C.

**Sweeney, M.R.**, Bolles, K., Forman, S.L., 2018, Revisiting the Dust Bowl: Evaluating natural

versus anthropogenic dust sources (Invited Presentation). Geological Society of America Abstracts with Programs, v. 50, no. 6.

\*Jurotich, M. and **Sweeney, M.R.**, 2018, Increase in suspended load contributions from

tributaries to the Missouri River, southeast South Dakota. Geological Society of America Abstracts with Programs, v. 50, no. 6.

\*Lacey, T.A. and **Sweeney, M.R.**, 2018, What the flux? Dust production from abrasion of aeolian

sands measured by PI-SWERL. Geological Society of America Abstracts with Programs, v. 50, no. 6.

McDonald, E.V., **Sweeney, M. R.**, Hanson, P.R., 2018, When did vesicular A (Av) horizons form in

the Desert SW U.S.: Elucidating between soil processes and luminescence ages. Geological Society of America Abstracts with Programs, v. 50, no. 6.

\*Jurotich, M., **Sweeney, M**., 2018, Effect of tributaries on suspended sediment concentration of

the Missouri River below Gavins Point Dam. SD EPSCoR Undergraduate Research Symposium, July 25-26, 2018, Pierre, SD.

**Sweeney, M.R**., Cowman, T.,2018, Sediment sources of the Lewis and Clark Lake delta,

Missouri River. Geological Society of America Abstracts with Programs, v. 50, no. 4.

**Sweeney, M.R.**, McDonald, E.V., 2017, Dust emission potential along the Interstate 8 corridor,

southern California and Arizona. Geological Society of America Abstracts with Programs, v. 49, no. 6.

McDonald, E.V., **Sweeney, M.R.**, 2017, Blowing dust and a dangerous highway: evaluating the

sources of dust along Interstate 10 between Phoenix and Tucson, Arizona. Geological Society of America Abstracts with Programs, v. 49, no. 6.

Lechler, A.R., Huntington, K., Breecker, D.O., **Sweeney, M.R.**, Schauer, A.J., 2017, Carbonate

clumped isotope record of LGM-Holocene climate change across the Pacific Northwest US: insights from loess-paleosols and pluvial lakes. Geological Society of America Abstracts with Programs, v. 49, no. 6.

\*Vazquez, B., **Sweeney, M.**, 2017, Impact of drought on suspended load: the Vermillion, Big

Sioux, and James tributaries. SD EPSCoR Undergraduate Research Symposium, August 2-3, 2017, Pierre, SD.

**Sweeney, M.,** Cowman, T., 2017, Sediment sources and impacts of the 2011 flood on the Lewis

and Clark Lake delta. Missouri River Natural Resources Conference & BiOp Forum, Nebraska City, NE.

**Sweeney, M.,** Jarchow, M., 2016, Sustainable Rivers: Using place-based learning to integrate

science across the liberal arts curriculum. Earth Educators Rendezvous, Madison, WI. <http://serc.carleton.edu/earth_rendezvous/2016/program/talks/wednesdayB/136578.html>

**Sweeney, M.**, McDonald, E., Hanson, P., Chabela, L., 2015, Sand dunes exert control on alluvial

base level and soil formation, Eastern Mojave Desert, USA. Geological Society of America Abstracts with Programs, v. 47, no. 7, p. 737.

**Sweeney, M.**, McDonald, E., 2015, Fingerprinting sources of dust in the Mojave Desert, USA.

Batsheva de Rothschild Seminar on Atmospheric Dust, Dust Deposits and Soils in Deserts, Jerusalem, Israel. Invited.

**Sweeney, M.R.,** Lu, H., Cui, M., Mason, J.A., Feng, H., and Xu, Z., 2014, Sand dunes as potential

sources of dust in northern China. Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 35.

**Sweeney, M.R.,** McDonald, E.V., Gaylord, D.R., Roberts, H.M., and Busacca, A.J., 2014, The roles

of sediment supply, sediment availability, and wind in driving the loess engine of the Palouse, Pacific Northwest. Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 591.

Gaylord, D.R., **Sweeney, M.R.**, Foit, F.F. Jr., McDonald, E.V., and Roberts, H.M., 2014, Overview

of the geomorphic, sedimentary, stratigraphic and paleoclimatic history of sand-dominated Quaternary eolian deposits on the Columbia Plateau, WA. Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 591.

Roberts, H.M., King, G.E., Pearce, N.J.G., **Sweeney, M.R.**, Gaylord, D.R., and Busacca, A.J., 2014,

Reconciling the luminescence- and tephro-chronologies of the Palouse loess, Washington State, USA. Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 592.

King, G.E., Pearce, N.J.G., Roberts, H.M., Gaylord, D.R., **Sweeney, M.R.**, and Smith, V.C., 2014,

Re-evaluating the tephrochronology of the Palouse loess, Washington State, using single-shard major- and trace-element analyses. Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 592.

Lechler, A.R., Huntington, K.W., Breecker, D.O., **Sweeney, M.R.**, and Schauer, A.J., 2014,

Systematic variability in clumped isotope temperatures of loess carbonates during late Pleistocene climate change, Palouse loess, USA. Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 591.

Mason, J.A., **Sweeney, M.R.**, and Hanson, P.R., 2014, Wind-aligned landforms in thick loess of

the central USA: Mechanisms of formation and paleoenvironmental significance. International Conference on Loess Research, Warsaw, Poland, 8-9 Sept. 2014.

Huntington, K.W., Lechler, A.R., Hoke, G.D., Burgener, L.K., Breecker, D.O., and **Sweeney, M.**,

2014, Clumped isotope paleothermometry in soil carbonate. Goldschmidt Conference, Sacramento, CA, June 8-13, 2014.

Cui, M., Lu, H., **Sweeney, M.**, Mason, J., Feng, H., Xu, Z., 2014, Dust fluxes in northern desert

of China measured by PI-SWERL. Eighth International Conference on Aeolian Research, ICAR8, Lanzhou, China, July 2014.

**Sweeney, M.R.**, Cowman, T., Campbell, M., Dixon, M., Geary, N., and Boever, C., 2014,

Historical and predicted future sediment accumulation in the Niobrara River delta and Lewis and Clark Lake headwaters. Geological Society of America Abstracts with Programs, v. 46, no. 4, p. 4.

\*Herrig, K.G., Wetzel, R., **Sweeney, M.R.**, and Cowman, T., 2014, Influence of suspended load

on the dust emission potential of Missouri River sand bars. Geological Society of America Abstracts with Programs, v. 46, no. 4, p. 51.

\*Chabela, L.P., **Sweeney, M.R.**, and McDonald, E.V., 2013, Evidence for dune damming and

lake formation along the eastern margin of the Kelso Dunes, Mojave Desert, USA. Geological Society of America Abstracts with Programs, v. 45, no. 7.

\*Herrig, K.G., and **Sweeney, M.R.**, 2013, Dust emission potential of Missouri River sand bars

deposited by the 2011 flood, Geological Society of America Abstracts with Programs, v. 45, no. 7.

\*Wetzel, R., **Sweeney, M.R.**, and Cowman, T., 2013, Contributions of suspended load to the

Missouri River downstream of Gavins Point Dam, Yankton, South Dakota, Geological Society of America Abstracts with Programs, v. 45, no. 7.

Pearce, N.J.G., King, G.E., Roberts, H.M., Smith, V.C., Gaylord, D.R., and **Sweeney, M.R.**, 2013,

Tephrochronology of the Palouse Loess, Washington State, USA: reconciling luminescence dates with proximal and distal volcanic records from the Cascades. Canadian Quaternary Assoc. (CANQUA) biannual meeting, Edmonton, Canada, Aug. 18-22.

**Sweeney, M.R.**, Zlotnik, V.A., Joeckel, R.M., Gates, J., and Stout, J., 2012, Preliminary results

of dust emissions data from Yellow Lake playa, West Texas, USA. Geological Society of America Abstracts with Programs, v. 44, no. 7, p. 106.

Mason, J.A., Hanson, P.R., **Sweeney, M.R.**, Loope, H.M., Xiaodong, M., Lu, H., 2012, Aeolian

morphodynamics of loess landscapes. Eos Trans. AGU, 93*,* Fall Meet. Suppl., Abstract EP23A-0786.

***Undergraduate research projects supervised at USD (unless otherwise noted):***

* Wyatt Wiebelhaus, Anthropogenic dust emissions from off-road vehicle trails. *Undergraduate Research Excellence Award* winner 2022, 2023 (2022-2024)
* Nathan Cardona (Univ. Miami-Ohio), Suspended load of Nebraska tributaries along the 59-Mile segment of the MNRR. NSF REU: Sustainable RIVER (2019)
* Marcella Jurotich (Carlton College), Change in contribution of tributaries to suspended load of the Missouri River. NSF REU: Sustainable RIVER (2018)
* Rachel Jensen, Evaluating loess along the Missouri River in South Dakota (2018-2019)
* Tad Lacey, Using the PI-SWERL to evaluate dust emissions from dune sand (2017-2019) *Undergraduate Research Excellence Award* winner 2019
* Bethany Vazquez Maestre (Univ. Puerto Rico), Evaluating suspended load in Missouri River tributaries during progressive drought. NSF REU: Sustainable RIVER (2017)
* Ben Fischer, Using LiDAR to measure Missouri River sandbar erosion (2015-2016)
* Juan Correal, Characterization of sediment sources in the Lewis and Clark Lake Delta (2015)
* Lucas Chabela, Eolian-fluvial interactions in the Mojave Desert, CA (2013-2014)
* Ruthie Wetzel, Suspended load contribution of the James and Vermillion Rivers along the 59-mile Missouri River National Recreational River (Honors thesis, 2012-2014)
* Karen Herrig, Dust emissions from flood-deposited sand bars, Missouri River (2012-2014)
* Jordan Foye, Terra preta soils: sustainability in a temperate climate (Honors thesis, 2013)
* Zach Gaston, Comparing drainage density of North and South Dakota’s badlands using ArcGIS (2012)
* Matt Weyer, Bridge pier erosion simulated using a sediment transport flume (2012)
* Zac Irvine, Using the PI-SWERL to evaluate dust sources in Nebraska (2011)
* Cody Miller, Origin and erosion of Spirit Mound (2010)
* Kathryn Rathbun, Origin and paleoclimatic significance of loess in southeastern South Dakota (2010)
* Melissa Floren, Origin of gravel in the Missouri River near Yankton, SD (2010)
* Eli Erickson, Differentiating James and Missouri River sediments using grain size and geochemical methods (2009)
* Tim Spade, Surface water quality of southeastern South Dakota streams (2009)
* Chris Markley, Compositional heterogeneity of dust-producing landforms, Mojave Desert, CA (2009)
* Wendy Stiernagle, Mineralogy and soils within loess of South Dakota and Nebraska (2007)

***Graduate Students Supervised***

* Beatrice Ogbuagu, Ph.D., 2023-present, Sustainability, Sources of anthropogenic dust in the Great Basin of Utah, USA
* Gwenn Harsha, M.S., 2020-2024, Sustainability, “Characterizing dust emissions in the northern Chihuahua Desert, New Mexico & Texas, US”

***Graduate Student Committees (USD unless otherwise noted)***

* Evan Hartshorn, M.S., Hydrology, University of Nevada Reno, “Multi-scale analysis of intra-playa dust emission variability in the southwestern U.S.”
* Khushboo Jain, Ph.D., Sustainability, “Examining the causes and consequences of diverse agricultural management practices on crop productivity in eastern South Dakota”
* Thorn Merrill, M.S., Atmospheric Sciences, University of Utah, “The effects of moisture and surface crusts on dust emission from the Great Salt Lake playa”
* Madalyn Bollig, M.S., 2022, Biology, “Ecological changes of the lower Niobrara River Valley and Lewis and Clark Lake delta from past to present and future”
* Campbell Cooke, M.S., 2022, Sustainability, “Derivation of ecosystem services from geodiversity in the Black Hills”
* Amena Ruma, M.S., 2022, Biology, “Evolution of sandbar habitat along the Missouri River”
* Taylor Weeden, M.S., 2021, Geology, Baylor University, “Was there a northern dust bowl? Evidence for heightened wind erosion and dust sources during the 1930s in the Northern Great Plains, USA”
* Catherine Beall, M.S., 2019, Biology, “Historical Dynamics and Vegetation Patterns on the Lewis and Clark Reservoir Delta on the Missouri River”
* Kasey Bolles, Ph.D., 2018, Geology, Baylor University, “Reconstructing land surface processes of the 1930s Dust Bowl Drought, U.S. Great Plains”
* Victoria (Albers) Danzeisen, M.S., 2016, Biology, “Spatial patterns in cottonwood (*Populus deltoides*) recruitment following the 2011 Missouri River flood”
* Alex Cahlander-Mooers, M.S., 2014, Biology, “Classification and mapping of a riparian forest along the White River in South Dakota”
* Nicole Geary, M.F.A., 2013, Fine Arts
* Chad Lukens, M.S., 2013, Political Science, ”Cooperation and confrontation in a post-Cold War high north: An international relations approach to Arctic security”
* Matt Ley, M.S., 2011, Biology, ”Riparian forest vegetation patterns and channel dynamics of the Big Sioux River, South Dakota”

***Service***

**External Service**

**Discipline:**

* **Geological Society of America**
  + **Division board member:** Quaternary Geology & Geomorphology, 2021, elected
    - 2024-2023: Chair; 2022-2023: First Vice-Chair; 2021-2022: Second Vice-Chair
  + **Panelist:** Quaternary Geology & Geomorphology, 2016-2018, elected
  + **Field Trip:** Led a three-day field trip for the 2017 annual GSA meeting in Seattle, WA. Generation of the Palouse loess: Exploring the linkages between glaciation, outburst megafloods, and eolian deposition in Washington State
  + **Co-chair** sessions at annual GSA meetings, 2023, 2022, 2019, 2018, 2017, 2014, 2008
* **Manuscript Peer-Review:** Reviewsresearch manuscripts (59 since 2016) related to wind erosion and deposition in the following journals: *Aeolian Research, Catena, Earth Surface Processes and Landforms, Geochimica Cosmochimica Acta, Geoderma, Geological Society of America Bulletin, Geology, Geomorphology, Geophysical Research Letters, Global Change Biology, The Holocene, Journal of Arid Land, Journal of Geophysical Research – Earth Surface, Nature, Palaeogeography Palaeoclimatology Palaeoecology, Quaternary Research, Quaternary Science Reviews, Scientific Reports, Sedimentology, Sedimentary Geology*
* **Guest-Editor,** *Quaternary Research* special issue on aeolian deposits/processes: 2022-2023
* **Proposal Review**: Reviews research proposals (13 since 2016) related to wind erosion and deposition from the following agencies: National Science Foundation, Israel Science Foundation, U.S. Army Corps of Engineers, Murdock Trust, and Icelandic Research Fund

## Community:

* **Board Member:** Joint Powers Board, Solid Waste, Clay and Yankton Counties, 2020-present
* **Board Member:** Greening Vermillion, 2016-2021
  + Mission: To engage our community in creating a more sustainable Vermillion.
  + Supervised recycling education/guide 2018-2020.
* **Presentations at local schools:**
  + Science behind Climate Change, Niobrara middle and high school earth science classes, March 2008, December 2015; Vermillion Middle School 6th grade science class, March 2010
* **Community presentations:**
  + 2011: “Citizens’ Guide to Climate Change”, Sierra Club, Living River Chapter
  + 2012: “Who stopped the rain? Drought in the Great Plains”, Sierra Club
  + 2013: “A geologic excursion to China: history recorded in dust”, Vermillion Public Library
  + 2014: Summer science fair, Vermillion Library hands-on rock, mineral, and fossil demonstration
  + 2015: “What you should know about climate change”, Clay County Democrats
  + 2016: Stream table demonstration for Isaac Walton League science day, Wayne, NE
  + 2018: “Library Rocks!”, Yankton Library hands-on rocks & minerals demo for grade school
* **OLLI** (Oeschger Lifelong Learning Institute): short courses
  + 2012: Citizens’ Guide to Climate Change
  + 2013: Who Stopped the Rain: Drought on the Great Plains
  + 2019: Living in a changing climate: the science behind it and what we can do about it
  + 2024: Geology of Spirit Mound

## University Service – University of South Dakota

**University Level:**

* **President’s Committee on Sustainability**, 2018-present
* **Graduate Council**, Jan.-Apr. 2023 (by proxy)
* **Faculty Senate**, elected 2014-2018 (2 consecutive terms); fall 2019 (by proxy)
  + Senate Nominating Committee: 2014-2016
  + Senate Rules Committee: 2015-2017
* **Academic Misconduct Board**, 2014-2018
  + Served on 12 panels (chaired 5 of those) for student plagiarism and misconduct
* **Scholarship Days/Interviews**, 2010-2017
  + Interview incoming freshman for scholarships
* **University Curriculum and Instruction Committee**, 2008-2009

**College Level – College of Arts & Sciences**

* **Promotion and Tenure Committee**, 2016-2017; 2018-2020; Chair, 2019
* **Sustainability Advisory Committee**, 2014-present
  + To advise goals and curricular planning for the Sustainability Program
  + Graduate Student Subcommittee
* **Scholarship Committee**, 2009-2011; 2016-2018
  + Review and rank student applications for college scholarships
* **Blue Ribbon Task Force on Recruitment**, 2016-2017
  + Strategies to increase recruiting and enrollment in the college
* **Curriculum and Instruction Committee**, 2007-2009; 2013-2015, elected committee chair 2014-2015
  + Review proposed curricular changes in the college
* **Science & Math Division**, electedChair, 2013-2014; Vice-Chair, 2012-2013
  + Primary responsibility to review faculty applications for College awards
* **Sustainability Search Committee**, 2011, 2012
  + Goal to hire faculty position for new Sustainability Program

**Department Level – Sustainability & Environment/Earth Sciences**

* **Sustainability Newsletter**, coordinate once per semester, 2019-present
* **Sustainability Promotion and Tenure Committee**, 2020 (chair), 2022
* **Physics Promotion and Tenure Committee,** 2023
* **Sustainability Faculty Search Committee**, 2018, 2019, 2022, 2023-2024
* **South Dakota Science Olympiad**: 2007-present; Remote Sensing, Geologic Mapping, Hydrogeology, Dynamic Planet
* **Earth Science Lab Instructor Search Committee**, 2011.
* **Earth Sciences Promotion and Tenure Committee**, 2009, 2010.
* **Faculty Advisor, Geology Club**, University of South Dakota 2006-2018.
* **Earth Science Week:** arranged for documentary showings; gave lecture in 2013

## *Society Membership*

* American Geophysical Union (2002-)
* Geological Society of America (1997-)
* International Association of Sedimentologists (2001-)
* Society for Sedimentary Geology (SEPM) (1999-)
* Sigma Xi (2007-)
* National Association of Geoscience Teachers (2016-)
* International Society for Aeolian Research (2020-)