# Joseph A. Mason

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**Research Interests:** Eolian and hillslope geomorphology, loess stratigraphy/sedimentology, pedology and soil geomorphology, paleopedology, Quaternary landscape evolution, geomorphic response to Quaternary climate change. *Geographic focus:* Great Plains, northern China, central Rocky Mountains, Upper Mississippi Valley.

**Formal Education**

Ph. D., Geography, University of Wisconsin-Madison (1995). Dissertation title: "Effects of glacial-interglacial climate change on mass wasting, southeastern Minnesota." (Advisor: James C. Knox).
M. S., Soil Science, University of Minnesota (1992). Advisor: Edward A. Nater
B. S., University of Wisconsin--Stevens Point (1989). Major: Soil Science.

**Academic Positions**

Professor (2008-present), Associate Professor (2004-2008), Assistant Professor (2003-2004) Department of Geography, University of Wisconsin-Madison. Affiliate status in Department of Soil Science
Chair, Department of Geography, University of Wisconsin-Madison (2018-2021)
Visiting faculty, Nanjing University, 2018
Assistant Professor, Department of Geosciences and Conservation and Survey Division (Nebraska's state geological survey), University of Nebraska-Lincoln (1997-2003).
Assistant Professor, Department of Geography, Northern Illinois University (1995-1997).
Visiting Professor, Department of Geography, University of Oregon (Summer, 1995).
Lecturer, Department of Geography, University of Wisconsin-Madison (1993-1994).
Graduate Fellow, University of Wisconsin-Madison (1992-1993; 1994-95).
NSF Graduate Fellow, University of Minnesota (1989-91) and UW-Madison (1991-1992).

**Honors and Fellowships**

J. H. Mackin Grant, Geological Society of America, 1993.
National Science Foundation Graduate Fellowship, 1989-92.

## Publications

### *1. Peer-Reviewed Journal Articles (83 published)*

Huang, X., Miao, X., Chang, Q., Zhong, J., **Mason,** J.A., Hanson, P.R., Ou, X, Xu, L., Lai, Z., 2022. Tibetan dust accumulation linked to ecological and landscape response to global climate change. Geophysical Research Letters 49: e2021GL096615. https://doi.org/10.1029/2021GL096615

Li, S., **Mason**, J.A., Xu, Y., Xu, C., Zheng, G., Yizhaq, H., Pan, S., Lu, H., Xu, Z., 2021. Biogeomorphology of nebkhas in the Mu Us dune field, north central China: Chronological and morphological results. *Geomorphology* 107979. https://doi.org/10.1016/j.geomorph.2021.107979

Chen, Y., Yizhaq, H., **Mason**, J.A., Zhang, X., Xu, Z., 2021. Dune bistability identified by remote sensing in a semi-arid dune field of northern China. *Aeolian Research* 53:100751. https://doi.org/10.1016/j.aeolia.2021.100751.

Constantin, D., **Mason**, J.A., Veres, D., Hambach, U., Panaiotu, C.G., Zeeden, C., Zhou, L., Marković, S.B., Gerasimenko, N., Avram, A., Tecsa, V., Groza-Sacaciu, S.-M., del Valle Villalonga, L., Begy, R.C., and Timar-Gabor, A., 2021. OSL-dating of the Pleistocene-Holocene climatic transition in loess from China, Europe, and North America, and evidence for accretionary pedogenesis. *Earth Science Reviews* 221:103769. https://doi.org/10.1016/j.earscirev.2021.103769.

Xu, Z., **Mason**, J.A., Xu, C., Yi, S., Bathiany, S., Yizhaq, H., Zhou, Y., Holmgren, M., Lu, H., 2020. Critical transitions in Chinese dunes during the past 12,000 years. *Science Advances* 6:eaay8020. https://doi.org/10.1126/sciadv.aay8020.

Tecsa, V., **Mason**, J.A., Johnson, W.C., Miao, X., Constantin, D., Radu, S., Magdas, D.A., Veres, D., Marković, S.B., and Timar-Gabor, A., 2020. Late Pleistocene to Holocene loess in the central Great Plains: Optically stimulated luminescence dating and multi-proxy analysis of the Enders section (Nebraska, USA). *Quaternary Science Reviews* 229:106130. https://doi.org/10.1016/j.quascirev.2019.106130.

Johnson, W. C., Halfen, A. F., Spencer, J. Q. G., Hanson, P. R., **Mason**, J. A., and Young, A. R., 2019, Late MIS 3 stabilization of dunes in the eastern Central Great Plains, USA: *Aeolian Research* 36: 68-81. https://doi.org/10.1016/j.aeolia.2018.12.002.

Kasmerchak, C.S., **Mason**, J. A., Liang, M., 2019. Laser diffraction analysis of aggregate disintegration and stability in forest and grassland soils of northern Minnesota, U.S.A. *Geoderma* 338: 430-444. https://doi.org/10.1016/j.geoderma.2018.06.020.

Marković, S.B., Yang, S.L., **Mason**, J.A., Stevens, T., Vandenberghe, J., Yang, S., Veres, D., Újvari, G. Timar-Gabor, A., Zeeden, C., Guo, Z., Hao, Q., Obreht, I., Hambach, U., Wu, H., Gavrilov, M.B., Rof, C., Tomić, N., Lehmkuhl, F. 2018. Loess correlations:

Between myth and reality. *Palaogeography, Palaeoclimatology, Palaeoecology* 509:4-23. https://doi.org/10.1016/j.palaeo.2018.04.018.

Xu, Z., Stevens, T., Yi, S., **Mason**, J.A., Lu, H., 2018. Seesaw pattern in dust accumulation on the Chinese Loess Plateau forced by late glacial shifts in the East Asian Monsoon. *Geology* 46: 871-874. https://doi.org/10.1130/G45105.1.

Schaetzl, R. J., Bettis, E. A., III, Crouvi, O., Fitzsimmons, K. E., Grimley, D. A., Hambach, U., Lehmkuhl, F., Marković, S. B., **Mason**, J. A., Owczarek, P., Roberts, H. M., Rousseau, D.-D., Stevens, T. Vandenberghe, J., Zárate, M., Veres, D., Yang, S., Zech, M., Conroy, J. L., Dave, A. K., Faust, D., Hao, Q., Obreht, I., Prud'homme, C., Smalley, I., Tripaldi, A., Zeeden, C., Zech, R. 2018. Approaches and challenges to the study of loess—Introduction to the LoessFest Special Issue. *Quaternary Research* 89: 563-618. https://doi.org/10.1017/qua.2018.15

Xu, Z., Hu, R., Wang, K., **Mason**, J.A., Wu, S.-Y., Lu, H., 2018. Recent greening in the Mu Us dune field, northern China, and its potential causes. *Land Degradation and Development* 29:1509-1520. https://doi.org/10.1002/ldr.2910

Xu, Z., **Mason**, J.A., Lu, H., Yi, S., Zhou, Y., Wu, J., Han, Z., 2017. Crescentic dune migration and stabilization: Implications for interpreting paleo-dune deposits as paleoenvironmental records. *Journal of Geographical Sciences* 27:1341-1358. https://doi.org/10.1007/s11442-017-1439-8

Yang, Y., **Mason**, J.A., Zhang, H., Lu, H., Ji, J., Chen, J., Liu, L., 2017. Provenance of loess in Nebraska, U.S.A., based on Nd-Sr isotopic composition, and paleoenvironmental implications. *Quaternary Science Reviews* 173:114-123. https://doi.org/10.1016/j.quascirev.2017.08.009

Woodburn, T.L., Johnson, W.C., **Mason**, J.A., Bozarth, S.R, Halfen, A.F., 2016. Vegetation dynamics during the Pleistocene-Holocene transition in the central Great Plains, USA. Holocene 27:155-163. https://doi.org/10.1177%2F0959683616652710

**Mason**, J.A., Jacobs, P.M., Gruley, K.E., Reyerson, P., and Hanson, P.R. 2016. Parent material influence on soil response to vegetation change, southeastern Minnesota, USA. *Geoderma* 275:1-17. https://doi.org/10.1016/j.geoderma.2016.04.004

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* 59:760-769. https://doi.org/10.1007/s11430-015-5246-8

Miao, X., Wang, H., Hanson, P.R., **Mason**, J.A., and Liu, X. 2016. A new method to constrain soil development time using both OSL and radiocarbon dating. *Geoderma* 261:93-100. https://doi.org/10.1016/j.geoderma.2015.07.004

**Mason**, J.A. 2015. Up in the refrigerator: Geomorphic response to periglacial environments in the Upper Mississippi River basin, USA. *Geomorphology* 248:363-381. ***Invited***

***review.*** https://doi.org/10.1016/j.geomorph.2015.08.004

Xu, Z., Lu, H., Yi, S., Vandenberghe, J., **Mason**, J.A., Zhou, Y., and Wang, X. 2015. Climate-driven changes to dune activity during the Last Glacial Maximum and deglaciation in the Mu Us dune field, north-central China. *Earth and Planetary Science Letters* 427:149-159. https://doi.org/10.1016/j.epsl.2015.07.002

Hanson, P.R., **Mason**, J.A., Jacobs, P.M., and Young, A.R. 2015. Evidence for bioturbation of luminescence signals in eolian sand on upland ridgetops, southeastern Minnesota. *Quaternary International* 362:108-115. https://doi.org/10.1016/j.quaint.2014.06.039

Xu, Z., **Mason**, J.A., and Lu. H. 2015. Vegetated dune morphodynamics during recent stabilization of the Mu Us dune field, north-central China. *Geomorphology* 228: 486-503. https://doi.org/10.1016/j.geomorph.2014.10.001

Chen, Y., Lu, H., Yi, S., Zhang, E., Xu, Z., Yu, K., and **Mason**, J.A., 2015. A preliminary reconstruction of precipitation in southern Mu Us sandy land at margin of Asian monsoon-dominated region during late Quaternary. *Journal of Geographical Sciences* 3: 301-310. https://doi.org/10.1007/s11442-015-1169-8

Albani, S., Mahowald, N.M., Winckler, G., Anderson, R.F., Bradtmiller, L.I., Delmonte,B., Francois, R., Goman, M., Heavens, N.G., Hesse, P.P., Hovan, S.A., Kang, S.G., Kohfeld, K.E., Lu, H., Maggi, V., **Mason**, J.A., Mayewski, P.A., McGee, D., Miao, X., Otto-Bliesner, B.L., Perry, A.T., Pourmand, A., Roberts, H.M., Rosenbloom, N., Stevens, T., Sun, J. 2015. Twelve thousand years of dust: the Holocene global dust cycle constrained by natural archives. *Climates of the Past* 11:869-903. https://doi.org/10.5194/cp-11-869-2015

Schmeisser McKean, R.L., Goble, R.J., **Mason**, J.A., Swinehart, J.B., Loope, D.B., 2015. Temporal and spatial variability in dune reactivation across the Nebraska Sand Hills, USA. *Holocene* 25: 523-535. https://doi.org/10.1177%2F0959683614561889

Marín-Spiotta, E., Chaopricha, N.T., Plante, A.F., Diefendorf, A.F., Mueller, C.W., Grandy, A.S., **Mason**, J.A., 2014. Long-term stabilization deep soil carbon by fire and burial during early Holocene climate change. *Nature Geoscience* 6:428-432. https://doi.org/10.1038/ngeo2169

Sweeney, M.R., and **Mason**, J.A. 2013. Mechanisms of dust emission from Pleistocene loess deposits, Nebraska, USA. *Journal of Geophysical Research: Earth Surface Processes* 118:1-12. https://doi.org/10.1002/jgrf.20101

Lu, H., Yi, S., Liu, Z., **Mason**, J.A., Jiang, D., Cheng, J., Stevens, T., Xu, Z., Zhang, E., Jin, L., Zhang, Z., Guo, Z., Wang, Y., and Otto-Bliesner, B. 2013. Variation of East Asian monsoon precipitation during the past 21 k.y. and potential $CO_2$ forcing. *Geology* 41:1023-1026. https://doi.org/10.1130/G34488.1

Cook, B.I., Seager, R., Miller, R.L., and **Mason**, J.A. 2013. Intensification of North American megadroughts through surface and dust aerosol forcing. *Journal of Climate* 26: 4414-4430. https://doi.org/10.1175/JCLI-D-12-00022.1

Lu, H., Zhou, Y., Liu, W., **Mason**, J.A. 2012. Organic stable carbon isotopic composition reveals late Quaternary vegetation changes in the dune fields of northern China. *Quaternary Research* 77: 433-444

Jacobs, P.M., **Mason**, J.A., and Hanson, P.R. 2012. Loess mantle spatial variability and soil horizonation, southern Wisconsin. *Quaternary International* 265:43-53

**Mason**, J.A., Swinehart, J.B., Hanson, P.R., Loope, D.B., Goble, R.J., Miao, X., and Schmeisser, R.L. 2011. Pleistocene dune activity in the central Great Plains, U.S.A. *Quaternary Science Reviews* 30:3858-3870.

Lu, H., **Mason**, J.A., Stevens, T, Zhou, Y., Yi, S., and Miao, X. 2011. Response of surface processes to climatic change in the dunefields and Loess Plateau of North China during the Late Quaternary. *Earth Surface Processes and Landforms* 36: 1590-1603.

**Mason**, J.A., Greene, R.S.B., and Joeckel, R.M. 2011. Laser diffraction analysis of the disintegration of aeolian sedimentary aggregates in water. *Catena* 87: 107-118.

Jacobs, P.M., **Mason**, J.A., Hanson, P.R. 2011. Mississippi Valley regional source of loess on the southern Green Bay Lobe Land Surface, Wisconsin. *Quaternary Research* 75:574-583

Lu, H., Zhao, C., **Mason**, J.A., Yi, S., Zhao, H., Zhou, Y., Ji, J., and Swinehart, J. 2011. Holocene climatic changes revealed by aeolian deposits from the Qinghai Lake area (northeastern Qinghai-Tibetan Plateau) and possible forcing mechanisms. *The Holocene* 21:297-304.

Werner, C.M., **Mason**, J.A., and Hanson, P.R. 2011. Non-linear connections between dune activity and climate in the High Plains, Kansas and Oklahoma, USA. *Quaternary Research*, 75: 267-277.

Schmeisser, R.L., Loope, D.B., and **Mason**, J.A. 2010. Modern and late Holocene wind regimes over the Great Plains (central U.S.A.). *Quaternary Science Reviews* 29:554-566.

**Mason**, J.A., Lu, H.Y., Zhou, Y.L. Miao, X.D., Swinehart, J.B., Liu, Z., Goble, R.J., and Yi, S. 2009. Dune mobility and aridity at the desert margin of northern China at a time of peak monsoon strength. *Geology* 37:947-950.

Zhou, Y., Lu, H., Zhang, J., **Mason**, J.A., Zhou, L.P. 2009. Luminescence dating of sand-loess sequences and response of Mu Us and Otindag sand fields (North China) to climatic changes. *Journal of Quaternary Science* 24: 336-344.

**Mason**, J.A., Swinehart, J.B., Lu, H.Y., Miao, X.D., Cha, P., Zhou, Y.L. 2008. Limited change in dune mobility in response to a large change in wind power in semi-arid northern China since the 1970s. *Geomorphology* 102: 351-363.

**Mason**, J.A., Miao, X.D., Hanson, P.R., Johnson, W.C., Jacobs, P.M., and Goble, R.J. 2008. Loess record of the Late Pleistocene to Holocene transition on the central and northern Great Plains. *Quaternary Science Reviews* 27: 1772-1783

Zhou, Y. L., Lu H. Y., **Mason** J.A., Miao, X. D., Swinehart, J., Goble R. 2008. Optically stimulated luminescence dating of aeolian sand in the Otindag dune field and Holocene climate change. *Science in China Series D: Earth Sciences* 51: 837-847.

Loope, D.B., Seiler, W.M., **Mason**, J.A., Chan, M.A. 2008. Wind scour of Navajo Sandstone at the Wave (Central Colorado Plateau, U.S.A). *Journal of Geology* 116: 173-183.

Johnson, W.C., Willey, K.L., **Mason**, J.A., and May, D.E. 2007. Stratigraphy and environmental reconstruction at the Middle Wisconsinan Gilman Canyon Formation type locality, Buzzard's Roost, Southwestern Nebraska, U.S.A. *Quaternary Research* 67: 474-486

**Mason**, J.A., Joeckel, R.M., and Bettis, E.A., III. 2007. Middle to Late Pleistocene loess record in eastern Nebraska, U.S.A., and implications for the unique nature of Oxygen Isotope Stage 2. *Quaternary Science Reviews* 26: 773-792.

Jacobs, P.M., and **Mason**, J.A. 2007. Late-Quaternary climate change, loess sedimentation, and soil profile development in the central Great Plains: A pedosedimentary model. *Geological Society of America Bulletin* 119: 462-475

Miao, X.D., **Mason**, J.A., Johnson, W.C., and Wang, H. 2007. High-resolution proxy record of Holocene climate from a loess section in Southwestern Nebraska, USA. *Palaeogeography, Palaeoclimatology, Palaeoecology* 245:368-381.

Miao, X.D., **Mason**, J.A., Swinehart, J.B., Loope, D.B., Hanson, P.R., Goble, R.J., and Liu, X.D. 2007. A 10,000-yr record of dune activity, dust storms, and severe drought in the central Great Plains, U.S.A. *Geology* 35: 119-122.

Wang, H, **Mason**, J.A., and Balsam, W.L. 2006. The importance of both geological and pedological processes in control of grain size and sedimentation rates in Peoria Loess. *Geoderma* 136: 388-400.

Sridhar, V., Loope, D.B., Swinehart, J.B., **Mason,** J.A., Oglesby, R, J., and Rowe, C.M. 2006. Large wind shift on the Great Plains during the Medieval Warm Period, *Science* 313: 345 – 347, DOI: 10.1126/science.1128941

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*Sciences*, 27: 684-690

Hanson, P. R., **Mason**, J. A., and Goble, R.J. 2006. Terrace formation along the non-glaciated Laramie Range, Wyoming. *Geomorphology* 26:12-25.

Lu, H.Y., Miao, X.D., Zhou, Y.L., **Mason**, J.A., Swinehart, J., Zhang, J.F., Zhou, L.P., Yi, S.W. 2005. Late Quaternary aeolian activity in the Mu Us and Otindag dunefields (north China) and lagged response to insolation forcing. *Geophysical Research Letters* 32: L21716, doi:10.1029/2005GL024560.

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Feggestad, A.J., Jacobs, P.M., Miao, X.-D., and **Mason**, J.A. 2004. Stable carbon isotope record of Holocene environmental change in the Central Great Plains. *Physical Geography* 25: 170-190.

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activity linked to hydrological drought, Nebraska Sand Hills, USA. *The Holocene* 14: 209-217.

**Mason**, J. A., Jacobs, P.M., Hanson, P.R., Miao, X.-M., and Goble, R.J. 2003. Sources and paleoclimatic significance of Holocene Bignell Loess, central Great Plains, USA. *Quaternary Research* 60: 330-339.

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Mays, M. D., Nettleton, W.D., Greene, R.S.B., and **Mason**, J.A. 2003. Dispersibility of glacial loess in particle size analysis. *Australian Journal of Soil Science* 41: 229-244.

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Konen, M. E., Jacobs, P.M., Burras, C.L., Talaga, B.J., and **Mason**, J.A. 2002. Equations for predicting soil organic carbon using loss-on-ignition for selected soils of the north central United States. *Soil Science Society of America Journal* 66:1878-1881

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**Mason**, J. A., and Kuzila, M.S. 2000. Episodic Holocene loess deposition in central Nebraska. *Quaternary International* 67:119-131.

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implications for paleoclimatic inference. *Quaternary International* 51/52: 169-174.

**Mason**, J. A., and Jacobs, P.M. 1998. Chemical and particle size evidence for addition of fine dust to soils of the midwestern United States. *Geology* 26: 1135-1138.

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***2. Book Chapters***

**Mason**, J.A., Swinehart, J.B., and Loope, D.B., 2020. The Nebraska Sand Hills p. 585-603 in N. Lancaster and P. Hesp, *Dunes of North America*. Springer.

**Mason**, J.A., Jacobs, P.M., and Leigh, D.S., 2019. Loess, eolian sand, and colluvium in the Driftless Area, pp. 61-73 in E. Carson, J. Elmo Rawling III, J. Michael Daniels, and J.W. Attig. *The Physical Geography and Geology of the Driftless Area: The Career and Contributions of James C. Knox*. Special Paper 543. Geological Society of America, Boulder, Colorado.

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*Quaternary Science* (S. Elias, ed.). Elsevier.

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***3. Textbook***

**Mason**, J.A., Burt, J., Muller, P.O., and de Blij, H.J., 2016. *Physical Geography: The Global Environment, 5th Ed.* Oxford University Press, New York.

de Blij, H.J., Muller, P.O., Burt, J., and **Mason**, J.A. 2013. *Physical Geography: The Global Environment, 4th Ed.* Oxford University Press, New York.

***4. Field Trip Guidebook Section***

Bettis, E.A., III, J.A. **Mason**, J.B. Swinehart, X.-D. Miao, P.R. Hanson, R.J. Goble, D.B. Loope, P.M. Jacobs, H.M. Roberts. 2003. Cenozoic eolian sedimentary systems of the USA mid-continent. *In* D. Easterbrook (ed.), Quaternary Geology of the United States. Geological Society of America, Boulder, Colorado, pp. 195-218.

***5. Open-File Reports*** (internal state geological survey review only)

**Mason**, J. A., and R. M. Joeckel. 2002. Surficial geology of the Platte River Valley, Fremont to Ashland (Fremont East, Arlington, Valley, Wann, and Ashland East 7.5-Minute Quadrangles). Conservation and Survey Division Open-File Report 68, University of Nebraska, Lincoln [CDROM].

**Mason**, J. A., R. F. Diffendal, Jr., and R. M. Joeckel (Eds.). 2001. Program and Abstracts, 7th International Conference on Fluvial Sedimentology. Conservation and Survey Division Open-File Report 60, University of Nebraska, Lincoln [CDROM].

**Mason**, J. A. 2001. Surficial geology of the Fort Calhoun and Kennard Quadrangles, Nebraska. Conservation and Survey Division Open-File Report 56, University of Nebraska, Lincoln [CDROM].

***6. Digital Geologic Maps*** (internal state geological survey review only)

**Mason**, J. A. 1999. Surficial Geology of the Fort Calhoun 7.5' Quadrangle.
**Mason**, J. A. 1999. Stack Map of the Fort Calhoun 7.5' Quadrangle.
**Mason**, J. A. 1999. Surficial Geology of the Kennard 7.5' Quadrangle.
**Mason**, J. A. 1999. Stack Map of the Kennard 7.5' Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2000. Surficial Geology of the Arlington 7.5' Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2000. Stack Map of the Arlington 7.5' Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2000. Surficial Geology of the Valley 7.5' Quadrangle.

**Mason**, J. A., and R. M. Joeckel. 2000. Stack Map of the Valley 7.5' Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2000. Surficial Geology of the Wann 7.5' Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2000. Stack Map of the Wann 7.5' Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2001. Surficial Geology of the Ashland East Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2001. Stack Map of the Ashland East Quadrangle.
R. M. Joeckel and J. A. **Mason**. 2001. Surficial Geology of the Fremont East Quadrangle.
R. M. Joeckel and J. A. **Mason**. 2001. Stack Map of the Fremont East Quadrangle.
**Mason**, J. A., and R. M. Joeckel. 2003. Stack Map of the Ashland West Quadrangle.

**External Research Funding** (does not include funding for geologic mapping through STATEMAP program at UNL)

National Science Foundation, "Coevolution of Aeolian Landscapes and Soils," EAR-1920625, PI: J.A. **Mason**, Co-PI: Erika Marín-Spiotta, $331,900, 2019-2023 (with extensions).

National Science Foundation, "Collaborative Research: Vulnerability of carbon in buried soils to climate change and landscape disturbance," EAR-1623814, PI: Erika Marín-Spiotta, Co-PI: J.A. **Mason**, collaborative project with UC-Merced (PI: Asmeret Asefaw Berhe) and Boise State Univ. (PI: Marie-Anne de Graff), total award of $776,800 (UW-Madison portion $399, 932), 2016-2022 (with extensions).

National Science Foundation, "Effects of Past Vegetation Change on Soil Formation Near the Prairie-Forest Vegetation Border with Implications for the Future," BCS-1263582, PI: J.A. **Mason**, $199,869, 2013-2016.

National Science Foundation, "Collaborative Research: Linking loess landforms and eolian processes," EAR-0921312, PIs: J.A. **Mason**, P.R. Hanson (University of Nebraska), and M. Sweeney (University of South Dakota), $248,797 (award to all three institutions, UW-Madison portion is $152,306), 2009-2011.

National Science Foundation, "Collaborative Research: The significance of the loess mantle in Midwestern soil catena evolution," BCS-0751750 PIs: J.A. **Mason**, P.M. Jacobs (Univ. of Wisconsin-Whitewater) and P.R Hanson (University of Nebraska), $239,840 (award to all three institutions, UW-Madison portion is $162,169), 2008-2011.

National Science Foundation, "Acquisition of an X-ray diffraction unit for earth science research and education at the University of Wisconsin, Madison," EAR-0824890, P.I. Huifang Xu, Co-P.I.s Clark Johnson, Eric Roden, Joseph **Mason**, Nita Sahai, $148,346, 2008-2009.

National Science Foundation, "Collaborative Research: Dunefield records of late Quaternary climate change, northern China," ATM-0502489 and ATM-0502511; PIs: J.A. **Mason**, R.J. Goble (Univ. of Nebraska) and J.B. Swinehart (Univ. of Nebraska), Collaborator: H.-Y. Lu, Nanjing University. $376,246 (award to both institutions, UW-Madison portion is $288,665), 2005-2010.

National Science Foundation, "Collaborative Research: Resolving the Enigma of Late Quaternary Loess on the Great Plains," BCS-0352683 and BCS-0352748; PIs: J.A. **Mason** and D. B. Loope (Univ. of Nebraska), Co-PIs: R.J. Goble and J.B. Swinehart (Univ. of Nebraska), Collaborator: H.-Y. Lu, Chinese Academy of Sciences—Institute of Earth Environment. $249,817 (award to both institutions, UW-Madison portion is $133, 561), 2004-2007.

National Science Foundation, "Sand Hills Biocomplexity: Integrating Biogeophysical Processes Across Time and Space," PI: D. Wedin, Co-PIs: G. M. Henebry, D. B. Loope, Co-Investigators: T. J. Arkebauer, D. P. Billesbach, S. C. Fritz, R. J. Goble, D. C. Gosselin, F. E. Harvey, Q. Hu, J. A. **Mason**, C. M. Rowe, J. B. Swinehart, C. W. Zanner, V. A. Zlotnik. $1,794,236, 2003-2008 [award to University of Nebraska-Lincoln, with subcontract of $27,549 to UW-Madison for Mason's contribution].

U. S. Geological Survey, "Evaluation of Conductive Properties of Surficial Aquifer in the Nebraska Sand Hills," P. I.: V. Zlotnik, Co-P. I.'s: D. Loope and **J. A. Mason**, $14,946, 2001-2002.

National Science Foundation "Collaborative Research: A Detailed Chronology of the Loess-Paleosol Record of the Last Two Glacial/Interglacial Cycles in the North American Midcontinent," P. I.'s: E. A. Bettis III (University of Iowa), **J. A. Mason**, and J. Morris (Washington University), $222,495 [total to all institutions, University of Nebraska-Lincoln portion = $38,063], 2001-2003.

National Science Foundation, "Collaborative Research: Detecting Spatial Patterns of Dust Effects on Soils: Testing New methodology in the Central Great Plains," P. I.'s: **J. A. Mason** and P. M. Jacobs (Univ. of Wisconsin-Whitewater), $180,000 [total to all institutions, University of Nebraska-Lincoln portion = $100, 365], 2000-2003.

National Science Foundation, "Biocomplexity Incubation Activity - Spatio-temporal coupling of ecological and geological dynamics in the Nebraska Sandhills," P. I.: David Wedin, Co-P. I.'s: G. Henebry, D. Loope, A. Joern, T. Arkebauer, S. Fritz, J. Knops, **J. A. Mason,** W.Schacht, and J. Clark, $100,000, 2000-2002.

**Invited Lectures**

1998 Northern Illinois University, Department of Geography
1999 University of Minnesota, Department of Soil Science
1999 University of Minnesota, Department of Geology and Geophysics
2003 Nebraska Society of Professional Soil Scientists
2003 Northern Illinois University, Department of Geology
2004 University of Wisconsin-Eau Claire, Department of Geography
2004 Institute for Earth Environment-Chinese Academy of Sciences
2005 American Quaternary Association
2005 University of Minnesota, Quaternary Paleoecology Program
2006 Minnesota Native Plant Society, Annual Symposium

2008 Nanjing University
2010 American Quaternary Association
2011 University of Minnesota, Department of Soil, Water, and Climate
2011 University of Minnesota, Quaternary Paleoecology Program
2012 American Quaternary Association
2013 Wisconsin State Historical Museum, History Sandwiched In series
2013 Pardee Symposium, Geological Society of America Annual Meeting
2014 DFG (German Science Foundation), invited talk at conference in Gargan, Iran (declined)
2014 Nanjing University, College of Geographic and Oceanographic Science
2018 Nanjing University, College of Geographic and Oceanographic Science
2021 University of Iowa, Department of Geosciences

**Course Development**

Developed online version of Geography 342 (Geography of Wisconsin), with grant from UW-Madison Continuing Studies, 2013-2014. Course has subsequently been offered in each summer term and spring semester.

**Courses Taught**

***A. At University of Nebraska-Lincoln, Department of Geosciences:***
Physical Geology
Environmental Geology
Soil Geomorphology
Urban and Environmental Geology
GIS/RS Applications in Geosciences

***B. At Northern Illinois University, Department of Geography:***
Introduction to Natural Environmental Systems (= Intro. Physical Geography)
Introduction to Soil Science
Field Methods
Pedology

***C. At University of Oregon, Department of Geography:***
Geomorphology
Global Environmental Change

***D. At University of Wisconsin-Madison, Department of Geography:***
Geomorphology
Soil Geomorphology
Landforms and Landscapes of North America
The Quaternary Period
Global Physical Environments
Physical Systems of the Environment
Changing Landscapes of the American West
Geography of Wisconsin (classroom and online)

***E. At Nanjing University***
Processes of the Critical Zone

**Graduate Students Advised**

***A. At Northern Illinois University***
Jay Angel, M. S. 1997
Mukila Maitha, M. S. 1997
Jennifer Troast, M. S. 1998.
Cathryn Dowd, M. S., 1998.
William Wetzel, M. S. 1998
Mark Stelford, Ph. D. 2001 (I was advisor, 1995-1997)

***B. At University of Nebraska-Lincoln***

Paul R. Hanson, M.S. 2002, Ph. D., 2005. Currently Professor, University of Nebraska-Lincoln
Xiaodong Miao, transferred to UW-Madison

***C. At UW-Madison***

Xiaodong Miao, Ph.D. 2005, currently faculty member at Linyi University, China
Corey Werner, Ph.D. 2007, currently Professor, Central Missouri State University
Paul Reyerson, Ph.D. 2012, currently Assistant Professor, UW-LaCrosse
Henry Loope, Ph.D. 2013, currently Geologist, Indiana Geological Survey
Kristine Gruley, Ph.D., 2014, currently at Savanna Institute
Samantha Greene, Ph.D. 2013, currently environmental consultant
Fei Ma, M.S., Ph.D. 2017, currently data scientist
Karen Russ, Ph.D. student, withdrew from program
Aaron Feggestad, M.S., 2005, currently environmental consultant
Anthony Beauchaine, M.S. 2008
Laura Eddey, M.S. 2014, Ph.D. Sheffield University, currently instructor at Sheffield University
Leslie Sinak, M.S., 2013
Chase Kasmerchak, M.S. 2016, currently Ph.D. student, UW-Madison
Kevin McKeehan, M.S. 2019, Ph.D., Michigan State
Taylor McDowell, M.S. 2020, currently Ph.D. student, UW-Madison

***D. At Institute for Earth Environment-Chinese Academy of Sciences***

Zhou Yali, Ph.D. 2008 (coadvisor), currently Associate Professor, Sha'anxi Normal University

***E. At Nanjing University***

Xu Zhiwei, Ph.D. 2013 (coadvisor), currently Associate Professor, Nanjing University

**Other Undergraduate Student Teaching/Mentoring/Research Experience(examples):**

Guided 20 students and three faculty from Nanjing University, China, on a field tour of geomorphology in the central Rocky Mountains and Great Plains (2012)

Research Mentor, Undergraduate Research Scholars Program (2006-2007): Supervised work by Phueng Cha on the NSF-funded project, "Dunefield records of late Quaternary climate change, northern China." I trained Phueng Cha in the use of ArcGIS, including several basic types of spatial analysis. Using ArcGIS and Excel, she studied the relationships between climate variables and NDVI in dunefields of north China over the period 1983-2003. She presented a poster on her work at the undergraduate research fair in spring, 2007, and she is a coauthor of a paper in press on remote-sensing based analysis of recent dunefield activity in north China.

Research Mentor, Undergraduate Research Scholars Program (2014-2015): Supervised work by Hawa Keita on the NSF-funded project, "Effects of Past Vegetation Change on Soil Formation Near the Prairie-Forest Vegetation Border with Implications for the Future" Hawa prepared samples for stable carbon isotope analysis and radiocarbon dating and presented a poster on preliminary results at the undergraduate research fair in 2015. Coauthor on a paper reporting the results that will be submitted soon (had to wait for completion of field sampling, isotopic measurements, and modeling that stretched over the following years).

Research Mentor, Undergraduate Research Scholars Program (2019-20): Supervised work by Tien Vo on the NSF-funded project, "Coevolution of Aeolian Landscapes and Soils" Tien carried out particle size and carbonate content analyses and assisted with moisture retention curve measurements, and gave a presentation on her work in spring, 2020. She has worked as an undergraduate assistant in this project starting in May, 2020. During the summer of 2020, I worked with her remotely on a GIS analysis for the project. She started with no knowledge of GIS and through the training that I provided she is now proficient in a wide variety of operations in ArcGIS. She will be a coauthor on one or more papers reporting project results.

Other Undergraduate Research Mentoring: Tony Giuffre, an undergraduate chemistry/geology major, carried out lab work for my projects over several years. I worked with him to test and refine several fairly complex lab procedures (e.g. soil phosphorus fractionation), and he then worked with Paul Reyerson to develop biogenic silica extraction methods for use in Paul's Ph.D. research. Tony recently reported results from his Ph.D. work at Virginia Tech in papers in *PNAS*. Mengyu Liang, an undergraduate geography major, worked for several years on my project on soil

response to vegetation change in northern Minnesota and is a coauthor of a published paper from that project.

Supervision of Senior Theses: Nicholas Legg (2006) studied paleohydrology of streams draining the Medicine Bow Mountains, Wyoming. I spent a week in the field in Wyoming with Nick, getting him started on data collection for this project. He is now completing a PhD. at Oregon State after working as an environmental consultant. Samantha Hayes (2009) studied clay mineralogy of Glacial Lake Oshkosh sediments, and then went on to an M.S. at Southern Illinois University. Mengyu Liang (2017) completed a thesis on land use change in relation to forest and prairie soils in northern Minnesota. Tien Vo plans to complete a senior thesis on remote sensing of vegetation response to wet and dry years in dune fields and loess landscapes of Nebraska (2022-23).

**Public Service Activities (examples):**

Gave a talk on the origin and geographic significance of Wisconsin's Central Sand Plain in the History Sandwiched In series at the Wisconsin State Historical Museum (2013).

Produced a report to Minnesota DNR foresters on soils of steep colluvial slopes on state forest lands in southeastern Minnesota (2009-2010).

Provided information on soils and geomorphology on colluvial slopes in southeastern Minnesota for MN Dept. of Natural Resources classification of natural plant communities; invited lecture on the same topic presented at MN Native Plant Society symposium, March 2006.

Provided information on Nebraska's loess hills to the village of Brady, Nebraska, for their website.

**Professional Service**

***National/International:***

Panelist, National Science Foundation Geography and Spatial Sciences Program, 2008-2010.

Associate Editor, *The Holocene* (2005-2016); generally one of the three top-ranked journals in the field of Quaternary studies, covering environmental change over the past 11,000 years, and I was one of two editors handling most North American papers.

Reviewer for *Aeolian Research, Annals of the American Association of Geographers, Catena, Journal of Arid Environments, The Holocene, Earth Surface Processes and Landforms, Earth and Planetary Science Letters, Earth Science Reviews, European Journal of Soil Science, Geochimica et Cosmochimica Acta, Geoderma, Geology, Geological Society of America Bulletin, Geoarchaeology, Geomorphology, Geophysical Research Letters, Nature*

*Geoscience, Quaternary Research, Quaternary International, Journal of Quaternary Science, Quaternary Science Reviews, Journal of Sedimentary Research, Soil Science Society of America Journal,* special publications of the Soil Science Society of America and INQUA, the U. S. Geological Survey, the National Science Foundation, the Royal Netherlands Academy of Science, the Polish National Science Centre, and the Israel Science Foundation.

Abstract Coordinator for Seventh International Conference on Fluvial Sedimentology, Lincoln Nebraska, August 2001 (compiled and edited > 230 abstracts).

Nebraska representative (1998-2002) and 2002 chair of NCR-3 Committee; this committee, sponsored by the U. S. D. A., coordinates linkages between soil scientists at Midwestern land grant universities and the National Cooperative Soil Survey.

***UW-Madison/other universities and potentially K-12 schools:***

Starting in Fall 2021, I have worked with a group of faculty and graduate students from several programs on a project to develop curriculum acknowledging and critically examining the role of Indigenous dispossession in the development of the University, including land grants under the Morrill Act. In planning for this effort we met with and sought input from members of Tribal Nations in the state involved in education, some of whom also attended a later meeting where we presented our plans for specific projects. We have made significant progress towards development of teaching materials and have a pending National Endowment for the Humanities grant proposal that would support additional work. The materials developed area intended for initial use at UW-Madison but will also be useful for people working on similar issues at other universities and possibly K-12 schools.

***UW-Madison:***

University Library Committee (Physical Sciences Division representative, 2005-2008)

Campus Planning Committee (non-voting member representing University Library Committee, 2007-8)

Faculty Appeals Committee, College of Letters and Science (2004-2006);

Department of Geography: *Department Chair* (2019-2021); *Chair*, DEIC Committee (2022-23), Curriculum Committee (2017-18), Graduate Affairs Committee (2014-2016), Graduate Budget Committee (2006-9), Faculty Recruitment Committee (2007), Departmental Services Committee (2012-2014); *member*, Advisory Committee (2007-8), Faculty Evaluation and Compensation (formerly Budget) Committee (2006-2007; 2012-2013; 2022-23), Curriculum Committee (2012-2013, 2016), Graduate Affairs Committee (2003-9), Staff Evaluation and Compensation Committee (2022-23)  Advisor for Physical Geography, Area Studies, and Honors (2003-2005; 2009-10, 2011-2012).

Wisconsin Geological and Natural History Survey, UW-Extension: Search committee member (2007)

Department of Geoscience, UW-Madison: Search committee member (2013-14)