

Hilary R. Martens, Ph.D.

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🌐 h-index: 14 | i10-index: 15

Employment History

Primary Appointments

- 2022 – **Associate Professor of Geophysics (with tenure)**, Department of Geosciences, The University of Montana, Missoula, Montana, USA.
- 2017 – **Director of the University of Montana Seismic Network**, Montana, USA.
- 2016 – 2022 **Assistant Professor of Geophysics**, Department of Geosciences, The University of Montana, Missoula, Montana, USA.
- 03/2016 – 06/2016 **Postdoctoral Scholar in Geophysics**, Seismological Laboratory, California Institute of Technology, Pasadena, California, USA.
- 2011 – 2016 **Graduate Research Fellow**, Seismological Laboratory, California Institute of Technology, Pasadena, California, USA.
- 2012 – 2016 **Resident Associate**, Institute Housing Office, California Institute of Technology, Pasadena, California, USA.

Affiliate & Visiting Appointments

- 06/2023 – 01/2024 **Academic Guest**, Institute of Geophysics, ETH Zürich, Switzerland.
- 09/2023 – 11/2023 **Visiting Professor**, Seismological Laboratory, Caltech, California, USA.
- 2018 – **Affiliate Research Assistant Professor**, Montana Bureau of Mines and Geology, Montana Technological University, Butte, Montana, USA.
- 05/2019 – 12/2019 **Academic Guest**, Institute of Geophysics, ETH Zürich, Switzerland.
- 06/2018 – 08/2018 **Academic Guest**, Institute of Geophysics, ETH Zürich, Switzerland.

Education

- 2021–(2024) **M.B.A. candidate, College of Business, University of Montana.**
- 2011 – 2016 **Ph.D. Geophysics, California Institute of Technology (Caltech).**
Thesis title: *Using Earth deformation caused by surface mass loading to constrain the elastic structure of the crust and mantle*
URL: <http://thesis.library.caltech.edu/9666/>
- 2015 **M.S. Geophysics, California Institute of Technology.**
Minor degree: Planetary Sciences
- 2009 – 2010 **M.Phil. Geophysics, St. John's College, University of Cambridge.**
Thesis: *Microseismic evidence for active dyke emplacement in Iceland's N. Volcanic Zone*
- 2008 – 2009 **M.Sc. Space Science, University College London (UCL), with distinction.**
Thesis: *Spokes on Saturn's B-ring: Exploring a magnetic connection with the atmosphere*
- 2003 – 2008 **B.A. Physics, University of Montana, Missoula, with high honors.**
Thesis: *Observations of molecular oxygen ions in Saturn's inner magnetosphere*
Minor degree: Mathematics
- B.A. Fine Arts - Music, University of Montana, Missoula, with high honors.**
Concentrations: Violin performance and music composition.

Awards & Honors

- 2023
- **Sabbatical Award**, ETH Zürich in Switzerland and Caltech/JPL in Pasadena, CA, USA.
 - **Merit Award for Outstanding Faculty Performance**, U. Montana. 2023.
- 2022
- **Tenure Award**, University of Montana.
- 2021
- **Helen and Winston Cox Educational Excellence Award**, College of Humanities and Sciences, University of Montana.
 - **Merit Award for Outstanding Faculty Performance**, U. Montana. 2021.
- 2019
- **Outstanding Alumni Award**, Davidson Honors College, University of Montana.
 - **Faculty Fellowship**, Montana Space Grant Consortium. Funding: \$7500.
 - **Merit Award for Outstanding Faculty Performance**, U. Montana. 1 October 2019.
- 2017
- **Student Author Award**, Geophysical Journal International. Selection Criteria: “Designed to recognise and acknowledge the best papers submitted to GJI by young scientists in the field.” Award: Open-access publication & £750.
- 2014
- **NASA Earth & Space Science Fellowship (NESSF)**, National Aeronautics & Space Administration (NASA), Earth Sciences Division. Success Rate: ~13% (54/410). Selection Criteria: scientific merit, relevance of proposed research, academic excellence. \$30,000/year for 3 years.
- 2010
- **NSF Graduate Research Fellowship**, National Science Foundation (NSF). Success Rate: ~14% (2000/~14,000). Selection Criteria: intellectual merit (advancing knowledge), broader impacts (societal benefit). Funding: \$32,000/yr stipend + \$12,000/yr educational allowance for 3 years.
 - **Gates Cambridge Scholarship**, Gates Foundation. (*Declined, to accept offer at Caltech*). Success Rate: ~2% (95/~4000). Selection Criteria: academic excellence, leadership potential, and commitment to improving the lives of others. Funding: university & college fees + annual maintenance allowance (~£13000/year) for 3 years.
- 2009
- **NASA Group Achievement Award**, Cassini Plasma Spectrometer Team, National Aeronautics & Space Administration (NASA).
 - **Best Overall Achievement**, MSc Space Science Program, Department of Space & Climate Physics, University College London. Context: 1 award per year.
- 2008
- **Marshall Scholarship**, Marshall Aid Commemoration Commission. Success Rate: ~4% (37/886). Selection Criteria: academic merit, leadership potential, and ambassadorial potential. Funding: Two years of fully funded graduate study in the UK.
 - **Mortar Board Outstanding Senior Award**, Davidson Honors College, University of Montana. Context: 1 award per year.
 - **Best Poster Presentation**, Physical Sciences Division, University of Montana Conference on Undergraduate Research (UMCUR).
- 2007
- **Glamour Magazine Top 10 College Women**, Glamour Magazine. Success Rate: ~1% (10/~1000). Selection Criteria: leadership, community and campus involvement, and academic excellence. Award: \$2000 + New York photoshoot and appearance in magazine.
 - **National Student Delegate**, Triennial Convention, Honor Society of Phi Kappa Phi. Orlando, Florida, USA.
- 2006
- **Goldwater Scholarship**, Barry Goldwater Scholarship & Excellence in Education Foundation. Selection Criteria: strong commitment to a research career in the natural sciences, mathematics and engineering; effective display of intellectual intensity in the sciences, mathematics and engineering; potential for a significant future contribution to research. Funding: \$7500.
 - **Watkins Research Scholarship**, University of Montana. Award: \$2000.
- 2005
- **Undergraduate Research Award**, University of Montana. Award: \$500.
- 2003
- **Presidential Leadership Scholarship**, Davidson Honors College, University of Montana. Success Rate: ~5%. Funding: \$20,000 + tuition & fees for 4 years.

Awards & Honors (continued)

- **Presidential Scholarship**, Montana State University. (*Declined, to attend University of Montana*). Success Rate: ~5%. Funding: \$10,000 + tuition & fees for 4 years.
- **Music Performance Scholarship**, School of Music, University of Montana. Award: \$800.
- **Thrivent Financial Scholarship**, Thrivent Financial. Award: \$1000/yr for 4 years.
- **Distinguished President Award**, Key Club International, Sentinel High School.
- **Scholastic Excellence Award**, United States Marine Corps, Sentinel High School.
- **Most Outstanding Senior Award**, Sentinel High School, Missoula, Montana, USA. Context: 1 award per year.
- **Presidential Freedom Scholarship**, Sentinel High School. Award: \$500.
- **High School Honors Scholarship**, Montana University System. Funding: University tuition and fees for 1 year.
- 2002 ■ **Lt Governor of Montana Girls' State**. Award: \$300 American Legion Auxiliary Scholarship.

Research Publications

Journal Articles (* = UM Graduate Student | ** = UM Undergraduate Student | ° = UM Postdoc)

- 1 *Swarr, M. J., **Martens, H. R.**, & Fu, Y. (2024). Sensitivity of GNSS-derived estimates of terrestrial water storage to assumed Earth structure. *J. Geophys. Res. Solid Earth*, in revision.
- 2 Boehm, C., **Martens, H. R.**, van Driel, M., Dmitrovskii, A., & Khan, A. (2024). Surface loading on a 3D elastic Earth: Methods and verification. *Geophys. J. Int.*, nearing submission.
- 3 Cao, Q., Pan, M., Knappe, E., White, A. M., Gardner, W. P., Borsa, A., Argus, D. F., **Martens, H. R.**, Hartman, R., Wilson, A., Su, L., & Ralph, F. M. (2024). Hydrologic signals in GNSS geodesy and their implications for future hydrology. *Water Resources Res.*, in review.
- 4 Lin, F., Sun, Y., **Martens, H. R.**, Zhang, B., & Zheng, S. (2024). Identification of GPS stations affected by poroelastic deformation using phase information from GPS and GRACE/GRACE-FO observations. *J. Geod.*, in review.
- 5 **Martens, H. R.**, Lau, N., *Swarr, M. J., Argus, D. F., Cao, Q., °Young, Z., Borsa, A., Pan, M., Wilson, A. M., Knappe, E., Ralph, F. M., & Gardner, W. P. (2024). Gns geodesy quantifies water-storage replenishment and drought improvements in California spurred by atmospheric rivers. *Geophys. Res. Lett.*, in review.
- 6 *Clayton, N., Knappe, E., °White, A., **Martens, H. R.**, Argus, D., Lau, N., Borsa, A., Bendick, R., & Gardner, W. P. (2023). Investigating watershed storage connectivity using the elastic deformation of the earth. *Nature Communications: Earth & Environment*, in revision.
- 7 *Duzet, C., **Martens, H. R.**, & Stickney, M. C. (2023). 1-D seismic velocity models for west-central and western Montana. *Seismol. Res. Lett.*, 94, 2257–2272. [doi:10.1785/0220220202](https://doi.org/10.1785/0220220202)
- 8 °White, A., °Lajoie, L. J., °Knappe, E., **Martens, H. R.**, *Swarr, M., *Khatiwada, A., *Oliver, B., *Perry, M., *Clayton, N., Bendick, R., Borsa, A. A., Argus, D. F., & Gardner, W. P. (2023). High-density integrated GNSS and hydrologic monitoring network for short-scale hydrogeodesy in high mountain watersheds. *Earth & Space Sci.*, 10, e2022EA002678. [doi:10.1029/2022EA002678](https://doi.org/10.1029/2022EA002678)
- 9 °White, A., Gardner, W. P., Borsa, A., Argus, D., & **Martens, H. R.** (2022b). A review of GNSS/GPS in hydrogeodesy: Hydrologic loading applications and their implications for water resource research. *Water Resources Res.*, 58, e2022WR032078. [doi:10.1029/2022WR032078](https://doi.org/10.1029/2022WR032078)

- 10 Argus, D. F., **Martens, H. R.**, Borsa, A. A., Knappe, E., Wiese, D. N., Alam, S., Anderson, M., *Khawiwada, A., Lau, N., Peidou, A., *Swarr, M., °White, A., Bos, M. S., Landerer, F. W., & Gardner, P. (2022). Subsurface water flux in California's Central Valley and its source watershed from space geodesy. *Geophys. Res. Lett.*, in press. [doi:10.1029/2022GL099583](https://doi.org/10.1029/2022GL099583)
- 11 *Smith, E. M., **Martens, H. R.**, & Stickney, M. C. (2021). Microseismic Evidence for Bookshelf Faulting in Western Montana. *Seismol. Res. Lett.*, 92(2A), 802–809. [doi:10.1785/0220200321](https://doi.org/10.1785/0220200321)
- 12 Xue, L., Fu, Y., & **Martens, H. R.** (2021). Seasonal hydrological loading in the Great Lakes region detected by GNSS: A comparison with hydrological models. *Geophys. J. Int.*, 226(2), 1174–1186. [doi:10.1093/gji/ggab158](https://doi.org/10.1093/gji/ggab158)
- 13 Argus, D. F., Ratliff, B., DeMets, C., Borsa, A. A., Wiese, D. N., Blewitt, G., Crowley, J. W., **Martens, H. R.**, Kreemer, C., & Landerer, F. W. (2020). Rise of Great Lakes surface water, sinking of the upper Midwest of the United States, and viscous collapse of the forebulge of the former Laurentide ice sheet. *J. Geophys. Res. Solid Earth*, 125(9), e2020JB019739. [doi:10.1029/2020JB019739](https://doi.org/10.1029/2020JB019739)
- 14 **Martens, H. R.**, Argus, D. F., **Norberg, C., Blewitt, G., Herring, T. A., Moore, A. W., Hammond, W. C., & Kreemer, C. (2020). Atmospheric pressure loading in GPS positions: Dependency on GPS processing methods and effect on assessment of seasonal deformation in the contiguous USA and Alaska. *J. Geod.*, 94(12), 1–22. [doi:10.1007/s00190-020-01445-w](https://doi.org/10.1007/s00190-020-01445-w)
- 15 **Martens, H. R.**, & Simons, M. (2020a). A comparison of predicted and observed ocean tidal loading in Alaska. *Geophys. J. Int.*, 223(1), 454–470. [doi:10.1093/gji/ggaa323](https://doi.org/10.1093/gji/ggaa323)
- 16 *Knappe, E., Bendick, R., **Martens, H. R.**, Argus, D. F., & Gardner, W. (2019). Downscaling vertical GPS observations to derive watershed-scale hydrologic loading in the Northern Rockies. *Water Resources Res.*, 55(1), 391–401. [doi:10.1029/2018WR023289](https://doi.org/10.1029/2018WR023289)
- 17 **Martens, H. R.**, Rivera, L., & Simons, M. (2019a). LoadDef: A Python-based toolkit to model elastic deformation caused by surface mass loading on spherically symmetric bodies. *Earth & Space Sci.*, 6(2), 311–323. [doi:10.1029/2018EA000462](https://doi.org/10.1029/2018EA000462)
- 18 McMahan, N. D., Yeck, W. L., Stickney, M. C., Aster, R. C., **Martens, H. R.**, & Benz, H. M. (2019). Spatiotemporal analysis of the foreshock–mainshock–aftershock sequence of the 6 July 2017 Mw 5.8 Lincoln, Montana, earthquake. *Seismol. Res. Lett.*, 90(1), 131–139. [doi:10.1785/0220180180](https://doi.org/10.1785/0220180180)
- 19 Argus, D. F., Landerer, F. W., Wiese, D. N., **Martens, H. R.**, Fu, Y., Famiglietti, J. S., Thomas, B. F., Farr, T. G., Moore, A. W., & Watkins, M. M. (2017). Sustained water loss in California's mountain ranges during severe drought from 2012 to 2015 inferred from GPS. *J. Geophys. Res. Solid Earth*, 122(12), 10559–10585. Winner of the NASA JPL Edward Stone Award 2018. [doi:10.1002/2017JB014424](https://doi.org/10.1002/2017JB014424)
- 20 **Martens, H. R.**, Rivera, L., Simons, M., & Ito, T. (2016). The sensitivity of surface mass loading displacement response to perturbations in the elastic structure of the crust and mantle. *J. Geophys. Res. Solid Earth*, 121(5), 3911–3938. [doi:10.1002/2015JB012456](https://doi.org/10.1002/2015JB012456)
- 21 **Martens, H. R.**, Simons, M., Owen, S., & Rivera, L. (2016). Observations of ocean tidal load response in South America from sub-daily GPS positions. *Geophys. J. Int.*, 205(3), 1637–1664. Winner of *GJI Student Author Award*. [doi:10.1093/gji/ggw087](https://doi.org/10.1093/gji/ggw087)
- 22 Lin, Y., Jolivet, R., Simons, M., Agram, P., **Martens, H. R.**, Li, Z., & Lodi, S. (2015). High interseismic coupling in the Eastern Makran (Pakistan) subduction zone. *Earth Planet. Sci. Lett.*, 420, 116–126. [doi:10.1016/j.epsl.2015.03.037](https://doi.org/10.1016/j.epsl.2015.03.037)
- 23 **Martens, H. R.**, Ingersoll, A. P., Ewald, S. P., Helfenstein, P., & Giese, B. (2015). Spatial distribution of ice blocks on Enceladus and implications for their origin and emplacement. *Icarus*, 245, 162–176. [doi:10.1016/j.icarus.2014.09.035](https://doi.org/10.1016/j.icarus.2014.09.035)

- 24 Schuler, J., Greenfield, T., White, R. S., Roecker, S. W., Brandsdóttir, B., Stock, J. M., Tarasewicz, J., **Martens, H. R.**, & Pugh, D. (2015). Seismic imaging of the shallow crust beneath the Krafla central volcano, NE Iceland. *J. Geophys. Res. Solid Earth*, 120(10), 7156–7173. [doi:10.1002/2015JB012350](https://doi.org/10.1002/2015JB012350)
- 25 **Martens, H. R.**, & White, R. S. (2013). Triggering of microearthquakes in Iceland by volatiles released from a dyke intrusion. *Geophys. J. Int.*, 194, 1738–1754. [doi:10.1093/gji/ggt184](https://doi.org/10.1093/gji/ggt184)
- 26 White, R. S., Drew, J., **Martens, H. R.**, Key, J., Soosalu, H., & Jakobsdóttir, S. S. (2011). Dynamics of dyke intrusion in the mid-crust of Iceland. *Earth Planet. Sci. Lett.*, 304(3), 300–312. [doi:10.1016/j.epsl.2011.02.038](https://doi.org/10.1016/j.epsl.2011.02.038)
- 27 **Martens, H. R.**, White, R. S., Key, J., Drew, J., Soosalu, H., & Jakobsdóttir, S. S. (2010). Dense seismic network provides new insight into the 2007 Uppþyppingar dyke intrusion. *Jökull*, 60, 47–66.
- 28 **Martens, H. R.**, Reisenfeld, D. B., Williams, J. D., Johnson, R. E., & Smith, H. T. (2008). Observations of molecular oxygen ions in Saturn's inner magnetosphere. *Geophys. Res. Lett.*, 35(L20103). Special Recognition as *GRL Highlight*. [doi:10.1029/2008GL035433](https://doi.org/10.1029/2008GL035433)

Conference Proceedings (* = UM Graduate Student | ** = UM Undergraduate Student | ° = UM Postdoc)

- 1 *Serviss, E., **Martens, H. R.**, & Simons, M. (2023). Inverting ocean tidal load displacements for elastic parameters in the crust and upper mantle. In *American Geophysical Union Fall Meeting*.
- 2 *Swarr, M., **Martens, H. R.**, & Fu, Y. (2023). Sensitivity of hydrologic surface mass loading to assumed Earth structure. In *American Geophysical Union Fall Meeting*.
- 3 °Young, Z., **Martens, H. R.**, & Hoylman, Z. H. (2023). A geodetic drought index calculated from hydrologic loading estimates. In *American Geophysical Union Fall Meeting*.
- 4 Dmitrovskii, A., Boehm, C., Munch, F. D., **Martens, H. R.**, & Khan, A. (2023). The effect of 3D Earth's structure on the ocean tide loading surface deformation. In *American Geophysical Union Fall Meeting*.
- 5 Dmitrovskii, A., Munch, F., **Martens, H. R.**, Boehm, C., & Khan, A. (2023). Use of ocean tide loading deformation to constrain tomographic models of the Earth. In *XXVIII General Assembly of the International Union of Geodesy and Geophysics (IUGG) (Berlin 2023)*. [doi:https://doi.org/10.57757/IUGG23-2255](https://doi.org/10.57757/IUGG23-2255)
- 6 Fu, Y., Xue, L., **Martens, H. R.**, Heerspink, B. P., Neto, H. L. G., Cicero, E., Kendall, A. D., Harig, C., & Freymueller, J. T. (2023). Hydrological loading deformation and estimates of groundwater variation in the Great Lakes region. In *American Geophysical Union Fall Meeting*.
- 7 **Martens, H. R.**, Simons, M., Rivera, L., *Serviss, E., & Moore, A. (2023). Oceanic load tides in the western U.S. In *GAGE/SAGE Science Workshop*. [poster].
- 8 *Khatiwada, A., **Martens, H. R.**, & Argus, D. F. (2022a). Investigating load-induced elastic Earth deformation using a homogeneous, non-gravitating half-space method and a homogeneous, gravitating, spherical method. In *AGU Fall Meeting Abstracts (Vol. 2022, G52A-01)*.
- 9 Argus, D. F., **Martens, H. R.**, Wiese, D. N., Borsa, A. A., *Swarr, M., Knappe, E., Lau, N., °White, A. M., Landerer, F. W., & Gardner, W. P. (2022). Fluctuation in subsurface water inferred from GPS elastic displacements: Insight on water cycle processes and the critical zone. In *AGU Fall Meeting Abstracts (Vol. 2022, G52A-02)*.
- 10 Cao, Q., Pan, M., Knappe, E., °White, A. M., Gardner, W. P., Hoylman, Z. H., Borsa, A. A., Argus, D. F., **Martens, H. R.**, Hartman, R., Wilson, A. M., Ralph, F. M., Bendick, R. O., & Lajoie, L. J. (2022). Hydrologic signals in GNSS geodesy and their implications for advancing hydrologic models. In *AGU Fall Meeting Abstracts (Vol. 2022, H22Q-1063)*.
- 11 Dmitrovskii, A., Boehm, C., **Martens, H. R.**, Khan, A., & van Driel, M. (2022). Ocean Tide-load Adjoint Sensitivity in 3D. In *AGU Fall Meeting Abstracts (Vol. 2022, G42B-0225)*.

- 12 Jaramillo, F., Wdowinski, S., Papa, F., Wang, J., Famiglietti, J., **Martens, H. R.**, & Wang-Erlandsson, L. (2022). Hydrogeodesy: A technological platform to evaluate the status of global water resources and stability of the Earth system, and to answer unsolved hydrological questions. In *AGU Fall Meeting Abstracts* (Vol. 2022, H35E-05).
- 13 **Martens, H. R.**, Argus, D. F., Borsa, A. A., Wiese, D. N., Knappe, E., *Swarr, M., Lau, N., Cao, Q., *Khatiwada, A., Landerer, F. W., & Gardner, W. P. (2022). Quantifying subsurface water loss during the present southwest u.s. drought, 2020-2022. In *AGU Fall Meeting Abstracts* (Vol. 2022, G16A-01).
- 14 *Khatiwada, A., **Martens, H. R.**, & Argus, D. (2022b). Investigating load-induced elastic earth deformation using a homogeneous, non-gravitating half-space method and a homogeneous, gravitating, spherical method. In *GAGE/SAGE Science Workshop*. [poster].
- 15 *Oliver, B., °White, A., Gardner, W., & **Martens, H. R.** (2022). Preliminary SWE results for calculating hydrologic load. In *AWRA*. [poster]. AWRA.
- 16 *Swarr, M., & **Martens, H. R.** (2022). Quantifying the spatial resolution limitations and optimal network distribution for GNSS water storage estimates inferred from Earth surface displacements. In *GAGE/SAGE Science Workshop*. [poster].
- 17 °White, A., Gardner, W., Hoylman, Z., & **Martens, H. R.** (2022a). Comparison of storage and hydrologic loading observed with GPS. In *AWRA*. [talk]. AWRA.
- 18 Argus, D., **Martens, H. R.**, Borsa, A., Knappe, E., Wiese, D., Alam, S., Anderson, M., *Khatiwada, A., Peidou, A., *Swarr, M., °White, A., & Landerer, F. (2022). Subsurface water flux in California's Central Valley and its source watershed from space geodesy. In *GAGE/SAGE Science Workshop*. [poster] | Presenter: Martens, H.R.
- 19 Argus, D., **Martens, H. R.**, Borsa, A., Wiese, D., Knappe, E., Larochele, S., Anderson, M., °White, A., Lau, N., Hoylman, Z., Peidou, A., *Khatiwada, A., *Swarr, M., Cao, Q., Avouac, J.-P., Gardner, W., & Landerer, F. (2022). Changes in water in the ground inferred from GPS observation of elastic displacements: How big are water fluctuations in the critical zone? In *Frontiers in Hydrology*. [talk]. Frontiers in Hydrology Meeting (FIHM).
- 20 Argus, D., **Martens, H. R.**, Borsa, A., Wiese, D., Knappe, E., Larochele, S., Anderson, M., Peidou, A., *Khatiwada, A., Lau, N., °White, A., Hoylman, Z., *Swarr, M., Cao, Q., Pan, M., Chanard, K., Avouac, J.-P., Gardner, W., & Landerer, F. (2022). Intensifying hydrologic drought in California. In *EGU Spring Meeting 2022*. EGU22-6800 [talk]. European Geophys. Union.
- 21 Dmitrovskii, A., **Martens, H. R.**, Khan, A., van Driel, M., & Boehm, C. (2022). Adjoint modeling of load-tide sensitivity. In *EGU Spring Meeting 2022*. EGU22-12362 [talk]. European Geophys. Union.
- 22 Knappe, E., Borsa, A., Lau, N., **Martens, H. R.**, Gardner, W., Argus, D., Cao, Q., Hoylman, Z., Wilson, A., & Ralph, M. (2022). Using GPS elastic displacements for tracking the storage and dissipation of atmospheric river storm water. In *Frontiers in Hydrology*. [talk]. Frontiers in Hydrology Meeting (FIHM).
- 23 **Martens, H. R.**, Argus, D., Borsa, A., Wiese, D., Knappe, E., Larochele, S., Anderson, M., Peidou, A., *Khatiwada, A., Lau, N., °White, A., Hoylman, Z., *Swarr, M., Cao, Q., Pan, M., Chanard, K., Avouac, J.-P., Gardner, W., & Landerer, F. (2022). Intensifying hydrologic drought in California. In *Frontiers in Hydrology*. 1033643 [talk]; speaker: Argus, D.F. Frontiers in Hydrology Meeting (FIHM).
- 24 **Martens, H. R.**, Simons, M., Rivera, L., *Serviss, E., & Moore, A. (2022). Oceanic load tides in the western United States. In *NASA Solid-Earth Team Meeting 2022*. La Jolla, CA [poster]. NASA Earth Surface and Interior Program.
- 25 **Martens, H. R.**, Simons, M., Rivera, L., van Driel, M., & Boehm, C. (2022). Oceanic load tides in the western United States. In *EGU Spring Meeting 2022*. EGU22-3240 [talk]. European Geophys. Union.

- 26 Oyedele, E., Fu, Y., & **Martens, H. R.** (2022a). Crustal deformation around Lake Mead, Nevada-Arizona due to current drought of 2022. In *Geological Society of America*. [poster].
- 27 Oyedele, E., Fu, Y., & **Martens, H. R.** (2022b). Crustal deformation around Lake Mead, Nevada-Arizona due to current drought of 2022. In *Amer. geophys. union*. [poster].
- 28 Oyedele, E., Fu, Y., & **Martens, H. R.** (2022c). Hydrological loading deformation around Lake Mead, Nevada-Arizona, USA. In *GAGE/SAGE Science Workshop*. [poster].
- 29 **Khatiwada, A., & **Martens, H. R.** (2021). Analyzing the multipath of GPS time series to study snow properties. In *GAGE/SAGE 2021 Community Science Workshop*. Session: *Geophysics as a window to the hydrosphere*. [e-lightning poster].
- 30 **Khatiwada, A., **Martens, H. R.**, & °Lajoie, L. (2021a). Analyzing the multipath of GPS time series to study snow properties. In *National Conference on Undergraduate Research*. Session: 323 [talk].
- 31 **Khatiwada, A., **Martens, H. R.**, & °Lajoie, L. (2021b). Analyzing the multipath of GPS time series to study snow properties. In *UM Conference on Undergraduate Research*. [poster].
- 32 *Doyle, B., **Martens, H. R.**, Fu, Y., & Xue, L. (2021a). Tracking changes in groundwater storage from GNSS geodesy in the Great Lakes region. In *GAGE/SAGE 2021 Community Science Workshop*. Session: *Geophysics as a window to the hydrosphere*. [e-lightning poster].
- 33 *Doyle, B., **Martens, H. R.**, Fu, Y., & Xue, L. (2021b). Tracking changes in groundwater storage from GNSS geodesy in the Great Lakes region. In *AGU Fall Meeting 2021*. Amer. Geophys. Union.
- 34 *Duzet, C., **Martens, H. R.**, & Stickney, M. (2021a). 1D crustal velocity model for west-central Montana. In *SSA Annual Meeting 2021*. [poster]. Seismolog. Soc. Amer.
- 35 *Duzet, C., **Martens, H. R.**, & Stickney, M. (2021b). 1D crustal velocity model for west-central Montana. In *GradCon 2021*. [poster]. University of Montana.
- 36 *Khatiwada, A., **Martens, H. R.**, Argus, D., Gardner, W., & Borsa, A. (2021). Analyzing the multipath of GPS time series to study snow properties. In *AGU Fall Meeting 2021*. G55A-0241 [poster]. Amer. Geophys. Union.
- 37 *Knappe, E., Argus, D., **Martens, H. R.** et al. (2021). Tracking the storage and dissipation of atmospheric river storm water in the Russian River watershed using GPS elastic displacements. In *EGU General Assembly 2021*. Abstract Number: EGU21-9270. European Geophys. Union.
- 38 °White, A., Hoylman, Z., Cao, Q., Knappe, E., °Lajoie, L., Pan, M., Hartman, R., Wilson, A., Argus, D., Ralph, M., Bendick, R., Borsa, A., Gardner, W., & **Martens, H. R.** (2021). Comparison of GPS observations of crustal deformation and hydrologic storage estimates. In *AGU Fall Meeting 2021*. G51A-06 [talk]. Amer. Geophys. Union.
- 39 Argus, D., Wiese, D., **Martens, H. R.**, Borsa, A., Knappe, E., Larochele, S., Avouac, J.-P., Chanard, K., Anderson, M., Peidou, A., & Landerer, F. (2021). Water loss in the western U.S. during drought in 2020 and 2021 estimated using GPS and GRACE. In *GAGE/SAGE 2021 Community Science Workshop*. Session: *Geophysics as a window to the hydrosphere*. [e-lightning poster].
- 40 Argus, D., **Martens, H. R.**, Knappe, E. et al. (2021). Estimating water change at Earth's surface using GRACE gravity and GPS positioning: Inferring groundwater change in the United States. In *EGU General Assembly 2021*. Abstract Number: EGU21-8578. European Geophys. Union.
- 41 Argus, D., **Martens, H. R.**, Wiese, D., Borsa, A., Knappe, E., Larochele, S., Avouac, J.-P., Chanard, K., Anderson, M., Peidou, A., °White, A., *Khatiwada, A., & Landerer, F. (2021). Loss of water in the ground in the southwest U.S. during drought in 2020 and 2021. In *AGU Fall Meeting 2021*. G13A-02 [talk]. Amer. Geophys. Union.
- 42 Argus, D., Wiese, D., **Martens, H. R.**, Anderson, M., Peidou, A., Borsa, A., Knappe, E., & Landerer, F. (2021). Estimating water change at Earth's surface using GRACE gravity and GPS positioning. In

Geodesy for Climate Research, Inter-Commission Committee (ICCC) Workshop. Abstract Number: So8Co7. International Assoc. Geodesy.

- 43 Cao, Q., °White, A., Knappe, E., Hoylman, Z., °Lajoie, L., Pan, M., Hartman, R., Wilson, A., Argus, D., Ralph, F., Bendick, R., Borsa, A., Gardner, W., & **Martens, H. R.** (2021). Hydrologic aignals in GNSS geodesy and their implications for future hydrology. In *AGU Fall Meeting 2021*. G51A-07 [talk]. Amer. Geophys. Union.
- 44 Gardner, W., *Clayton, N., **Martens, H. R.**, Knappe, E., & Borsa, A. (2021). Using elastic deformation of the earth's surface to investigate watershed storage-discharge relationships. In *AGU Fall Meeting 2021*. H35D-1068 [poster]. Amer. Geophys. Union.
- 45 Knappe, E., Lau, N., Cao, Q., Argus, D., Borsa, A., Gardner, W., Hoylman, Z., **Martens, H. R.**, Pan, M., Ralph, M., & Wilson, A. (2021). Tracking the storage and dissipation of atmospheric river storm water in the Russian River watershed using GPS elastic displacements. In *AGU Fall Meeting 2021*. G51A-04 [talk]. Amer. Geophys. Union.
- 46 **Martens, H. R.**, Argus, D., Borsa, A., Gardner, W., Knappe, E., °Lajoie, L., °White, A., Hoylman, Z., Wilson, A., Hartman, R., Cao, Q., Pan, M., Lau, N., Fu, Y., *Khatiwada, A., *Clayton, N., *Perry, M., *Swarr, M., *Oliver, B., ... Bendick, R. (2021). Assessing meteorological and hydrological drought in the western US using geodesy. In *AGU Fall Meeting 2021*. G55A-0240 [poster]. Amer. Geophys. Union.
- 47 **Martens, H. R.**, Boehm, C., van Driel, M., & Khan, A. (2021). Load-tide sensitivity to 3-D Earth structure. In *EGU General Assembly 2021*. Abstract Number: EGU21-3636. European Geophys. Union.
- 48 Oyedele, E., Fu, Y., **Martens, H. R.**, *Doyle, B., & Xue, L. (2021). Response of crustal deformation in Lake Mead due to current drought of 2021. In *AGU Fall Meeting 2021*. G55A-0245 [poster]. Amer. Geophys. Union.
- 49 **Norberg, C., & **Martens, H. R.** (2020). Exploring effects of GPS processing on atmospheric responses of Earth deformation. In *UM Conference on Undergraduate Research 2020*. April 2020 [poster].
- 50 *Clayton, N., Gardner, W., & **Martens, H. R.** (2020). Relating geodetic deflection to streamflow discharge through storage-discharge relationship. In *GSA Annual Meeting 2020*. Session: T180. Remote Sensing Applications in Hydrology. [talk]. Geological Soc. Amer.
- 51 Anderson, M., Argus, D., Lettenmaier, D., Reager, J., Wiese, D., **Martens, H. R.**, & Gardner, W. (2020). Accumulation and dissipation of water associated with flooding in the Missouri River Basin. In *AGU Fall Meeting 2020*. Abstract Number: Ho79-03 [talk]. Amer. Geophys. Union.
- 52 **Martens, H. R.**, Argus, D., Norberg, C., Blewitt, G., Herring, T., Moore, A., Hammond, W., Kreemer, C., & Bock, Y. (2020). Atmospheric pressure loading in GPS positions: A comparison of data products and processing methods for the contiguous U.S. and Alaska. In *AGU Fall Meeting 2020*. Abstract Number: G015-03 [talk]. Amer. Geophys. Union.
- 53 **Landry-Stahl, B., & **Martens, H. R.** (2019). Investigating ocean tidal models. In *UM Conference on Undergraduate Research 2019*. April 2019 [poster].
- 54 **Norberg, C., & **Martens, H. R.** (2019). Modeling surface mass load displacements in the Western US. In *UM Conference on Undergraduate Research 2019*. April 2019 [poster].
- 55 *Knappe, E., Bendick, R., **Martens, H. R.**, Argus, D., & Gardner, W. (2019). Downscaling GPS observations for watershed-scale hydrologic loading. In *AGU Fall Meeting 2019*. Abstract Number: G53A-01 [talk]. Amer. Geophys. Union.
- 56 *Smith, E., **Martens, H. R.**, & Stickney, M. (2019). Spatiotemporal aftershock analysis of the M5.8 Lincoln, Montana event. In *SSA Annual Meeting 2019*. [poster]. Seismolog. Soc. Amer.
- 57 Fu, Y., & **Martens, H. R.** (2019). The effect of Earth structure on the loading deformation around the Great Lakes. In *AGU Fall Meeting 2019*. Abstract Number: G53B-0629 [poster]. Amer. Geophys. Union.

- 58 **Norberg, C., & **Martens, H. R.** (2018). Modeling surface mass load displacements along the Cascadia subduction zone. In *UM Conference on Undergraduate Research 2019*. April 2018 [poster].
- 59 *Knappe, E., Bendick, R., **Martens, H. R.**, Gardner, W., & Argus, D. (2018). Comparison of downscaled vertical GPS observations to independent measures of hydrologic loading. In *AGU Fall Meeting 2018*. Abstract Number: G13B-0508 [poster]. Amer. Geophys. Union.
- 60 Boehm, C., **Martens, H. R.**, van Driel, M., & Khan, A. (2018). Forward and inverse modeling of body and ocean load tides in a 3D Earth. In *AGU Fall Meeting 2018*. Amer. Geophys. Union.
- 61 **Martens, H. R.**, Argus, D., *Knappe, E., Wiese, D., Bendick, R., Gardner, W., **Norberg, C., & Landerer, F. (2018). Tracking the storage and dissipation of storm snow and water in the Rocky Mountains using GPS observations of solid-earth deformation and GRACE gravity measurements. In *AGU Fall Meeting 2018*. Abstract Number: G13B-0520 [poster]. Amer. Geophys. Union.
- 62 Argus, D., Wiese, D., Landerer, F., Famiglietti, J., **Martens, H. R.**, Shirzaei, M., & Reager, J. (2017). Sustained changes in water storage across the western U.S. inferred from elastic land displacements observed with GPS: Parching of the ground during the summer of drought years and seeping of snow melt into the ground during the spring of heavy-precipitation years. In *AGU Fall Meeting 2017*. Abstract Number: G31E-02 [talk]. Amer. Geophys. Union.
- 63 Fu, Y., & **Martens, H. R.** (2017). Seasonal crustal loading deformation around the Great Lakes. In *AGU Fall Meeting 2017*. Abstract Number: G31A-0398 [poster]. Amer. Geophys. Union.
- 64 **Martens, H. R.**, & Stickney, M. (2017). Monitoring intraplate seismic activity along the Intermountain Seismic Belt, Montana, USA. In *EGU Galileo Conference on Environmental Seismology*. Ohlstadt, Germany [poster]. European Geophys. Union.
- 65 McMahan, N. D., Stickney, M. C., Aster, R. C., Yeck, W. L., **Martens, H. R.**, & Benz, H. M. (2017). Spatiotemporal analysis of the foreshock-mainshock-aftershock sequence of the 6 July 2017 M 5.8 Lincoln, Montana, earthquake. In *AGU Fall Meeting 2017*. Abstract Number: S21B-1082 [poster]. Amer. Geophys. Union.
- 66 **Martens, H. R.**, Simons, M., Moore, A., Owen, S., & Rivera, L. (2016). Improving the detection of tectonic transients in Japan by accounting for Earth's deformation response to surface mass loading. In *AGU Fall Meeting 2016*. Abstract Number: G33B-1099 [poster]. Amer. Geophys. Union.
- 67 **Martens, H. R.**, Simons, M., Rivera, L., & Owen, S. (2015). Towards inferring elastic structural variations from Earth's response to surface mass loading (*Invited*). In *AGU Fall Meeting 2015*. Abstract Number: G54A-07 [talk]. Amer. Geophys. Union.
- 68 Schuler, T., J. Greenfield, White, R., Roecker, S., Brandsdottir, B., Stock, J., Tarasewicz, J., **Martens, H. R.**, & Pugh, D. (2015). Seismic study of the velocity structure and earthquake focal mechanisms beneath the Krafla Central Volcano, NE Iceland. In *AGU Fall Meeting 2015*. Abstract Number: V13C-3154 [poster]. Amer. Geophys. Union.
- 69 **Martens, H. R.**, Simons, M., Ito, T., Owen, S., & Rivera, L. (2014). Using ocean tidal loads to explore upper mantle density and elastic structure. In *UNAVCO Science Workshop 2014*. [poster]. UNAVCO.
- 70 **Martens, H. R.**, Simons, M., Rivera, L., Owen, S., & Ito, T. (2014). Using ocean tidal load response to explore the elastic structure of the Amazonian Craton. In *AGU Fall Meeting 2014*. Abstract Number: G23B-0479 [poster]. Amer. Geophys. Union.
- 71 **Martens, H. R.**, Simons, M., & Ito, T. (2013). Using ocean tidal loads to probe upper mantle density and elastic structure. In *Tenth Annual Tectonics Observatory Meeting*. 15 October 2013. [poster]. Tectonics Observatory, Pasadena, California.
- 72 **Martens, H. R.**, Simons, M., & Ito, T. (2012). Inferring Earth structure from the response to ocean tidal loads. In *AGU Fall Meeting 2012*. Abstract Number: G13B-0951 [poster]. Amer. Geophys. Union.

- 73 **Martens, H. R.**, & White, R. (2010). Melt movement along a dyke at Upptyppingar, Northeast Iceland. In *New Advances in Geophysics Meeting 2010*. February 2010 [poster]. Geological Society, London, UK.
- 74 **Martens, H. R.** (2009a). Helioseismology. In *ESC Working Group Annual Workshop 2009*. September 2009, Azores, Portugal [talk]. European Seismological Commission.
- 75 **Martens, H. R.**, Reisenfeld, D., Williams, J., Johnson, R., & Smith, H. (2008). Observations of molecular oxygen ions in Saturn's inner magnetosphere. In *UM Conference on Undergraduate Research*. April 2008, Missoula, Montana [poster]. University of Montana.
- 76 **Martens, H. R.**, Reisenfeld, D., Williams, J., Johnson, R., Smith, H., Baragiola, R., Thomsen, M., Young, D., & Sittler, E. (2007). Molecular oxygen ions in Saturn's inner magnetosphere for the first 24 Cassini orbits. In *AGU Fall Meeting 2007*. Abstract Number: P43A1032M [poster]. Amer. Geophys. Union.
- 77 **Martens, H. R.**, & Reisenfeld, D. (2006). The plasma environment of Saturn's inner magnetosphere. In *Western Regional Honors Council Conference 2006*. April 2006, Denver, Colorado [poster]. Council on Undergraduate Research.
- 78 **Martens, H. R.**, Reisenfeld, D., & Williams, J. (2006). The detection of energetic nitrogen ions in Saturn's plasmasphere with the Cassini Plasma Spectrometer. In *National Collegiate Honors Council Conference 2006*. November 2006, Philadelphia, Pennsylvania [poster]. National Collegiate Honors Council.
- 79 **Martens, H. R.**, Reisenfeld, D., Williams, J., DiLorenzo, J., Thomsen, M., Smith, H., Eviatar, A., Johnson, R., Young, D., Sittler, E., & Baragiola, R. (2006). Abundances and energetics for water group and molecular oxygen ions in Saturn's magnetosphere after 24 Cassini orbits. In *Division of Planetary Sciences Conference 2006*. October 2006, Pasadena, California [poster]. American Astronomical Society.

Books, Chapters, and Theses

- 1 **Martens, H. R.** (2019a). *Natural disasters: Resource lists*. ScholarWorks, University of Montana: Open Educational Resources (OER) at University of Montana. Retrieved from <https://scholarworks.umt.edu/oer/4>
- 2 **Martens, H. R.** (2016). *Using Earth deformation caused by surface mass loading to constrain the elastic structure of the crust and mantle* (Doctoral dissertation, California Institute of Technology). Retrieved from <https://thesis.library.caltech.edu/9666/>
- 3 **Martens, H. R.** (2010a). *Microseismic evidence for active dyke emplacement in Iceland's Northern Volcanic Zone* (MPhil thesis, Bullard Laboratories, Department of Earth Sciences, University of Cambridge, Cambridge, UK).
- 4 **Martens, H. R.** (2009b). *Spokes on Saturn's B-ring: Exploring a magnetic connection with the atmosphere* (MSc thesis, Department of Space and Climate Physics, University College London, London, UK).

Data, Model, and Software Products

- 1 Gardner, W., Bendick, R., & **Martens, H. R.** (2020). *Selway GPS Network*. GAGE Facility operated by UNAVCO. [doi:10.7283/A76G-HP43](https://doi.org/10.7283/A76G-HP43)
- 2 **Martens, H. R.**, Rivera, L., & Simons, M. (2019b). *LoadDef: A Python-based toolkit to model elastic deformation caused by surface mass loading on spherically symmetric bodies*. Includes a user manual (93 pp). GitHub. Retrieved from <https://github.com/hrmartens/LoadDef>
- 3 **Martens, H. R.**, & University of Montana. (2017). *University of Montana Seismic Network*. International Federation of Digital Seismograph Networks. [doi:10.7914/SN/UM](https://doi.org/10.7914/SN/UM)

Seminars & Panels

Invited Seminars

- 2023
- **NASA Jet Propulsion Laboratory: 335 Forum**, Pasadena, California, Title: *What Lies Beneath: Insights into Earth structure from ocean tidal loading*. 26 October 2023.
 - **Caltech Division of Geological & Planetary Sciences Seminar**, Pasadena, California, Title: *Tracking water resources and probing Earth structure with space geodesy*. 2 October 2023.
 - **Montana Geohazards Workshop**, Helena, Montana, Title: *Drought and earthquakes in western Montana*. 26 April 2023.
 - **U to You Lecture Series**, Great Falls, Montana, Title: *Tracking water resources and drought conditions using space satellites*. 9 March 2023.
 - **Missoula Senior Forum**, Missoula, Montana, Title: *Earthquake activity in western Montana*. 1 February 2023.
- 2022
- **Missoula Senior Forum**, Missoula, Montana, Title: *Tracking water resources from space*. 30 November 2022.
 - **Seismology & Wave Physics Group**, ETH Zürich, Title: *Tracking water resources and constraining Earth structure with space geodesy*. October 2022.
 - **CIG Crustal Deformation Modeling Workshop**, Title: *Deformation of the Earth by load tides, atmosphere, and continental water*. June 2022. Host: Brad Aagaard.
 - **Montana Geohazards Workshop**, Montana Bureau of Mines and Geology, Title: *Examples of site-specific earthquake studies: The 2017 Lincoln earthquake mainshock-aftershock sequence*. 28 April 2022. Host: Yann Gavillot.
 - **Montana Geological Society**, Title: *Deciphering the 2017 M_{5.8} Lincoln aftershock sequence*. 12 April 2022. Host: Michael Hofmann.
 - **Department of Earth and Space Sciences Colloquium**, University of Washington, Seattle, Washington, USA. Title: *Tracking water resources and constraining Earth structure with space geodesy*. 10 February 2022. Host: Brad Lipovsky.
- 2021
- **Department of Earth Sciences Colloquium**, Montana State University, Montana, USA. Title: *Tracking water resources and constraining Earth structure with space geodesy*. 4 November 2021. Host: Madison Myers.
 - **Chemical & Physical Sciences Colloquium**, University of Toronto, Canada. Title: *Tracking water resources and constraining Earth structure with space geodesy*. 27 October 2021. Host: Semechah Lui.
 - **Geosciences Colloquium**, University of Oklahoma, Oklahoma, USA. Title: *Tracking water resources and constraining Earth structure with space geodesy*. 21 October 2021. Host: Junle Jiang.
 - **Plenary Address: GAGE/SAGE 2021 Community Science Workshop**, virtual conference. Title: *Constraining hydrologic loading with space geodesy*. Plenary Session: *Illuminating Transients in Earth Processes*. 18 August 2021. Host: William Frank, MIT. URL: <https://www.youtube.com/watch?v=9K-gMSUF0qg&list=PLzmugeDopLFNFKXl83hd7E6lBXmZDCNE2&index=6>.
 - **Center for Western Weather and Water Extremes (CW₃E) Annual Meeting**, Scripps Institution of Oceanography, University of California San Diego, USA. Title: *Quantifying Changes in Water Resources using GPS/GNSS*. 22 April 2021. Host: John Sequeira.
 - **IGPP Virtual Seminar Series, Scripps Institute of Oceanography**, University of California San Diego, USA. Title: *Deformation of the Earth by the oceans, atmosphere, and continental water*. 12 January 2021. Host: Ellen Knappe. General URL: <https://www.youtube.com/user/IGPPSIO>. Specific URL: <https://youtu.be/6mz9XVn34RQ>.
- 2020
- **Computer Sciences Seminar, University of Montana**, Missoula, Montana, USA. *Deformation of the Earth by the ocean tides, atmosphere, and continental water*. 14 October 2020. Host: Doug Brinkerhoff.

Seminars & Panels (continued)

- 2019 **Geophysical Colloquium, ETH Zürich**, Institute of Geophysics, ETH Zürich, Switzerland. Title: *Deformation of the Earth by ocean tides and continental water*. 18 October 2019. Host: Anne Obermann.
- Department of Earth Sciences Seminar, Montana Bureau of Mines and Geology**, Montana Technological University, Butte, Montana, USA. Title: *Earth deformation caused by surface mass loading*. 10 January 2019. Host: Colleen Elliott. URL: <https://youtu.be/JHCKcMPetv8>.
- 2018 **Ignite Session, UNAVCO Science Workshop**, Broomfield, Colorado, USA. Title: *Earth deformation driven by surface mass loading*. 28 March 2018. Host: Linda Rowan. URL: https://youtu.be/6_pV18iFTcQ.
- 2017 **Geophysical Colloquium, ETH Zürich**, Institute of Geophysics, ETH Zürich, Switzerland. Title: *Earth deformation caused by surface mass loading*. 23 May 2017. Host: Andreas Fichtner.
- Department Colloquium, Washington State University**, Department of Earth Sciences, School of the Environment, Washington State University and University of Idaho, Pullman, Washington, USA. Title: *Earth deformation caused by surface mass loading*. 21 September 2017. Host: Katie Cooper.
- 2015 **AGU Fall Meeting, Geodesy Section**, San Francisco, California, USA. *Towards inferring elastic structural variations from Earth's response to surface mass loading*. 18 December 2015. Session Coordinator: Yuning Fu.
- Company Seminar Series, Northrop Grumman Corporation**, Woodland Hills, California, USA. *Using ocean tidal loads to explore the elastic structure of the crust and upper mantle*. 16 March 2015. Host: Paul Kendall.
- 2013 **Earthquake Physics Seminar, University of Southern California**, USC, Los Angeles, California, USA. *Triggering of microearthquakes in Iceland by volatiles released from a dyke intrusion*. 29 October 2013. Host: Yehuda Ben-Zion.
- 2011 **Physics Department 100th Anniversary Celebration, University of Montana**, Department of Physics & Astronomy, University of Montana, Missoula, USA. *Research since UM graduation: Ocean tides, Icelandic volcanoes, and Saturn's moons*. 30 September 2011. Host: Andrew Ware.

Other Seminars

- 2021 **Geosciences Seminar, University of Montana**, Department of Geosciences, University of Montana, Missoula, USA. Title: *Tracking water resources and constraining Earth structure with space geodesy*. 18 October 2021. Host: Marc Hendrix.
- Geosciences Seminar, University of Montana**, Department of Geosciences, University of Montana, Missoula, USA. Title: *Deformation of the Earth by the hydrosphere and atmosphere*. 25 January 2021.
- 2019 **GeoClub Seminar, University of Montana**, Department of Geosciences, University of Montana, Missoula, Montana, USA. Title: *University of Montana Seismic Center*. 21 February 2019. Host: Bryana McKay.
- GeoClub Seminar, University of Montana**, Department of Geosciences, University of Montana, Missoula, Montana, USA. Title: *Earth deformation, earthquakes, and opportunities*. 4 February 2019. Host: Bryana McKay.
- 2016 **Job Seminar, University of Montana**, Department of Geosciences, Missoula, USA. Title: *Secrets of the subsurface revealed by seismicity: Application to Iceland and Montana*. 11 March 2016. Host: Rebecca Bendick.
- Job Seminar, University of Montana**, Department of Geosciences, Missoula, USA. Title: *Earth deformation caused by surface mass loading*. 10 March 2016. Host: Rebecca Bendick.
- PhD Defense, Caltech**, Seismological Laboratory, Caltech, Pasadena, California, USA. Title: *Earth deformation caused by surface mass loading*. 8 March 2016.

Seminars & Panels (continued)

- 2014 **Brown Bag Seminar, Caltech**, Seismological Laboratory, Caltech, Pasadena, California, USA. Title: *Using ocean tidal load response to explore the elastic structure of the Amazonian Craton*. 5 November 2014.
- 2013 **Brown Bag Seminar, Caltech**, Seismological Laboratory, Caltech, Pasadena, California, USA. *Anatomy of a dyke intrusion in Iceland's Northern Volcanic Zone*. 18 September 2013.
- 2005 **Summer Student Presentations, Mullard Space Science Laboratory**, University College London. Title: *Removal of spacecraft potential from Cassini's Electron Spectrometer dataset*. August 2005. London, UK. Advisors: Andrew J. Coates and Lin Gilbert.

Panels

- 2022 **DOE Integrated Mountainous Hydroclimate Workshop**, Department of Energy (DOE), Session: *Understanding and Predictability of Integrated Mountainous Hydroclimate*, 19 January 2022. Host: Michelle Newcomer.
- 2020 **Lowering Textbook Costs: Getting Started with Open Educational Resources (OER)**, Office of Organizational Learning and Development (OOLD), University of Montana. 30 October 2020. Co-Host: Wendy Walker.
- 2018 **How GIS is Changing the World**, Montana Association of Geographic Information Professionals and the UM Geography Club. Specialization: *Planetary GIS*. 8 March 2018. Burns St. Bistro, Missoula, Montana, USA. Host: Jennifer Haas, UM Geography.

Other Speaking Engagements

- 2022 **DHC 30th Anniversary Celebration**, Davidson Honors College (DHC), University of Montana, 10 September 2021.

Research Grants

Funded

- 1 Argus, D., Young, Z., & **Martens, H. R.** (2023). Global strain rate modeling. NASA Jet Propulsion Laboratory Sub-Contract. Amount Funded: **\$128,792**. Project dates: 07/06/2023 – 07/05/2025.
- 2 Rossmiller, Z., **Martens, H. R.**, Good, J., & Landguth, E. (2023). Equipment: CC* Data Storage: Improving research ability with data storage at the University of Montana. NSF Campus Cyberinfrastructure. Amount Funded: **\$499,047**. Project dates: 08/15/2023 – 07/31/2025. Solicitation: 23-526. Award number: 2321843.
- 3 **Martens, H. R.** (2021). CAREER: Deformation by surface loading from ocean tides and continental water on a 3-D Earth. NSF CAREER, EAR: Geophysics Program. Amount Funded: **\$689,069**. Project dates: 07/01/2022 – 06/30/2027. Solicitation: 20-525. Award number: 2144913.
- 4 Boehm, C., van Driel, M., Khan, A., & **Martens, H. R.** (2020). Towards a self-consistent Earth model from multi-scale joint inversion: Revealing Earth's mantle elasticity and density structure using seismic full-waveform inversion, tidal tomography, and homogenization. Swiss National Science Foundation (SNF). Amount Funded: **\$474,928**. Project dates: 01/01/2021 – 12/31/2022. Award Number: 200021_197369.
- 5 **Martens, H. R.** (2020). Summer Undergraduate Research Internships. NASA: Montana Space Grant Consortium. Amount Funded: **\$25,000**. Project dates: 2018, 2019, 2020 (x2), 2021.
- 6 **Martens, H. R.**, Gardner, W., Bendick, R., Borsa, A., Knappe, E., Ralph, M., Hoylman, Z., & Rossmiller, Z. (2020). Collaborative Research: New science, tools, and observations to couple geodesy

with hydrology for modeling, water storage change, and streamflow forecasting in mountain watersheds. NSF: Frontier Research in Earth Sciences. Amount Funded: **\$1,397,565 [UM] + \$1,028,766 [UCSD subaward]**. Project dates: 07/01/2020 – 06/30/2023. Award Number: 2021637.


- 7 **Martens, H. R.**, & Simons, M. (2020b). Elasticity and density structure of the crust and upper mantle in the western U.S. inferred from GNSS observations of ocean tidal loading. NASA: Earth Surface & Interior Program. Amount Funded: **\$443,627**. Project dates: 04/01/2021 – 03/31/2024. Solicitation: NNH20ZDA001N-ESI. Award number: 8oNSSC21Ko837.
- 8 Gardner, W., **Martens, H. R.**, & Bendick, R. (2019). Geodetic Lysimetry: GPS/GNSS observations to measure continuous, time-dependent water mass in mountainous watersheds. NSF: Hydrological Sciences. Amount Funded: **\$488,099**. Project dates: 07/15/2019 – 07/15/2022. Award Number: 1900646.
- 9 **Martens, H. R.** (2019b). OER@UMT Adapt Grant Award. Amount Funded: **\$1000**. Project dates: Spring 2019 for implementation in Fall 2019.
- 10 **Martens, H. R.** (2019c). Surface mass loading on a 3D Earth: Research collaboration with ETH Zürich in Switzerland. NASA: Montana Space Grant Consortium. Amount Funded: **\$7500**. Project dates: 06/2019 – 08/2019.
- 11 Rossmiller, Z., **Martens, H. R.**, Wheeler, T., Good, J., Landguth, E., & Hughes, T. (2019). Improved computing for advanced research and education (ICARE). NSF: CC* Compute. Amount Funded: **\$394,895**. Project dates: 07/01/2019 – 06/30/2020. Award Number: 1925267.
- 12 Argus, D., **Martens, H. R.**, Avouac, J.-P., & Milliner, C. (2018). Distinguishing between solid Earth deformation produced by slow slip events, mass loading, and groundwater fluctuations: Tracking the daily storage and dissipation of storm snow and water. NASA: Earth Surface & Interior Program. Amount Funded: **\$599,781 [Total]; \$75,646 [UM subaward]**. Project dates: 01/01/2019 – 12/31/2021. Solicitation: NNH18ZDA001N-ESI.
- 13 Fu, Y., & **Martens, H. R.** (2018). Earth structure around the Great Lakes constrained by loading deformation. NASA: Earth Surface & Interior Program. Amount Funded: **\$194,566 [BGSU] + \$184,927 [UM subaward]**. Project dates: 01/01/2019 – 12/31/2021. Solicitation: NNH18ZDA001N-ESI. Award Number: 8oNSCC19Ko361.
- 14 **Martens, H. R.** (2018). UM 3-D i-Globe Viewer. UM Student Instructional Equipment Fund (SIEF). Amount Funded: **\$12,945**. Project dates: 10/05/2018 – 05/14/2019.
- 15 Argus, D., & **Martens, H. R.** (2017). Weighing Earth's surface mass using GNSS, sharpening GRACE's spatial resolution, and evaluating the impact of drought in the U.S. JPL: Sub-Contract. Amount Funded: **\$30,810**. Project dates: 09/01/2017 – 08/31/2019. JPL Sub-Contract Number: 1587131.
- 16 **Martens, H. R.** (2017a). Early-career travel funding. European Geophysical Union (EGU) Galileo Conference on Environmental Seismology. Amount Funded: **275 €**. 6 – 9 June 2017. Ohlstadt, Germany.
- 17 **Martens, H. R.** (2017b). Improved geodetic monitoring of tectonic processes at convergent plate boundaries by accounting for Earth's deformation response to surface mass loading. NASA: Montana Space Grant Consortium, Research Initiation. Amount Funded: **\$44,298**. Project dates: 06/01/2017 – 12/31/2018. Solicitation: NNX15AK40A.
- 18 **Martens, H. R.** (2017c). UM Seismological Exhibit. UM Student Instructional Equipment Fund (SIEF). Amount Funded: **\$15,885**. Project dates: 10/01/2017 – 01/01/2018.
- 19 **Martens, H. R.** (2013). Using ocean tidal load response to explore upper mantle density and elastic structure. NASA: Earth and Space Science Fellowship (NESSF). Amount Funded: **\$90,000**. Project dates: 2014 – 2016.
- 20 **Martens, H. R.** (2010b). Production, distribution, and loss of molecular oxygen ions in Saturn's magnetosphere. NSF: Graduate Research Fellowship Program (GRFP). Amount Funded: **\$96,000 + tuition remission**. Project dates: 2010 – 2014. Grant Number: DGE-1144469.

Teaching

Courses Taught

- Spring 2024  **GEO 439: Geophysics**, U. Montana. 3 credits. Enrollment: TBD.
- Fall 2023  *Sabbatical.*
- Spring 2023  **GEO 546: Seismology & Geodesy**, U. Montana. 3 credits. Enrollment: 4.
- Fall 2022  **GEO 316: Getting Started in Research**, U. Montana. 2 credits. Enrollment: 5.
-  **GEO 597: Advanced Problems: Mentoring Undergraduate Research**, U. Montana. 1 credit. Enrollment: 3.
-  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 60.
- Spring 2022  **GEO 439: Geophysics**, U. Montana. 3 credits. Enrollment: 11.
-  **GEO 597: Advanced Problems, Hydrogeodesy**, U. Montana. 1 credit. Enrollment: 5.
-  **GEO 499: Senior Thesis**, U. Montana. 3 credits. Enrollment: 2.
- Fall 2021  **GEO 390: Getting Started in Research**, U. Montana. 2 credits. Enrollment: 7.
-  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 65.
-  **GEO 492: Independent Study**, U. Montana. 3 credits. Enrollment: 2.
- Spring 2021  **GEO 546: Seismology & Geodesy**, U. Montana. 3 credits. Enrollment: 3.
-  **GEO 597: Advanced Problems, Hydrogeodesy Literature**, U. Montana. 1 credit. Enrollment: 4.
-  **GEO 499: Senior Thesis**, U. Montana, 3 credits. Enrollment 1.
- Fall 2020  **GEO 224N: General Science, Physics & Geosciences**, U. Montana. 5 credits. Enrollment: 52. Includes a laboratory component.
-  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 72.
-  **GEO 499: Senior Thesis**, U. Montana, 3 credits. Enrollment 1.
- Spring 2020  **GEO 439: Geophysics**, U. Montana. 3 credits. Enrollment: 11.
-  **GEO 491: Undergraduate Research Methods**, U. Montana. 1 credit. Enrollment: 5.
-  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 61.
-  **GEO 492: Independent Study**, U. Montana. 2 credits. Enrollment 1.
-  **GEO 499: Senior Thesis**, U. Montana, 3 credits. Enrollment 2.
- Fall 2019  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 57.
-  **GEO 492: Independent Study**, U. Montana. 2 credits. Enrollment 1.
-  **GEO 499: Senior Thesis**, U. Montana, 3 credits. Enrollment 2.
- Summer 2019  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 11.
- Spring 2019  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 53.
- Fall 2018  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 52.
- Spring 2018  **GEO 582: Topics in Structure & Geophysics**, U. Montana. 3 credits. Enrollment: 3.
-  **GEO 491: Special Topics, Geophysics**, U. Montana. 3 credits. Enrollment: 9.
- Fall 2018  **GEO 107N: Natural Disasters**, U. Montana. 3 credits. Enrollment: 36.
- Spring 2017  **GEO 597: Special Topics, Geophysical Theory & Methods**, U. Montana. 3 credits. Enrollment: 7.

Special Courses & Workshops

- Summer 2022  **CUAHSI Workshop on Hydrogeodesy**, University of Montana [presenter]. Topics: LoadDef; Future of Hydrogeodesy. Non-credit-bearing. Participants: 15.

Teaching (continued)

- May 2022 **Guest Presentation for AP Physics II**, Sentinel High School, Missoula, MT. Topic: *How and why Earth changes in shape*.
- Summer 2021 **Special Field Workshop** for NSF-funded project in hydrogeodesy [co-organized]. Topics: Field safety and logistics, geodetic instrumentation and installation, weather station installation. U. Montana. Non-credit-bearing. Participants: 7. Organizers: 4.
- Spring 2021 **Guest Presentation for Graduate Workshop**. Topic: Generic Mapping Tools (GMT). U. Montana. 5 April 2021.

Research Advising

Postdoc Advising

- 3/23 – **Zachary Young, PhD**. Research topic: Hydrogeodesy and global strain rate.
- 11/20 – 11/22 **Alissa White, PhD**. Research topic: Hydrogeodesy.
- 6/20 – 8/21 **Lia Lajoie, PhD**. Research topic: Hydrogeodesy.

PhD Advising

- 2021 – **Matthew Swarr**, UM Geosciences. Defense: expected May 2026. Thesis topic: *Estimating water storage in mountain watersheds using satellite geodesy*.




PhD Committee Member

- 2022 – **Claire Gilder**, UM Geosciences.
- 2020 – **Andrei Dmitrovskii**, ETH Zürich.
- 2016 – 2019 **Ellen Knappe**, PhD, UM Geosciences. Defense Date: 12 August 2019. Dissertation title: *Dissertation title: Geodetic time series as observational constraints on tectonic and hydrologic deformation of the solid Earth*. URL: <https://scholarworks.umt.edu/etd/11452/>. Post-graduation employment: Postdoctoral Scholar, Scripps Institute of Oceanography.
- 2017 – 2021 **Mason Perry**, PhD, UM Geosciences. Qualifying Exam: 14 May 2018. Defense Date: 23 April 2021. Dissertation title: *Linking seismicity and time-variant loading of the solid earth*. Post-graduation employment: Postdoctoral Scholar, Earth Observatory of Singapore.





MS Advising

- 2022 – **Eleanor Serviss**, MS candidate. Defense expected May 2024. Thesis topic: *Using oceanic load tides to constrain solid-Earth structure*.
- 2021 – **Brett Oliver**, MS candidate (co-advised with Payton Gardner). Defense expected August 2023. Thesis topic: *Relationships between hydrological processes and surface deformation*. Post-degree employment: Montana Bureau of Mines and Geology.
- 2022 – 2023 **Brett Steck**, MS candidate. Thesis topic: *Developing a new earthquake catalog for western Montana*. Left for permanent employment prior to degree completion.
- 2021 – 2023 **Ashlesha Khatiwada**, MS. Defense: August 2023. Thesis: *Investigating Elastic Deformation Induced by Surface Loads on Planetary Bodies*. URL: <https://scholarworks.umt.edu/etd/12195/>. Post-grad employment: PhD student at Colorado State University.
- 2020 – 2022 **Courtenay Duzet**, MS. Defense: May 2022. Thesis: *1-D seismic velocity models for west-central and western Montana*. URL: <https://scholarworks.umt.edu/etd/11889/>. Post-grad employment: USGS, Communications.












Research Advising (continued)

- 2017 – 2020  **Baleigh Doyle**, MS candidate. Thesis topic: *Water-loading sensitivity to Earth structure in the Great Lakes region*. Left for permanent employment prior to degree completion.
- 2017 – 2019  **Ellen Smith**, MS. Thesis: *Microseismic evidence for bookshelf faulting in western Montana*. URL: <https://scholarworks.umt.edu/etd/11495/>. Post-grad employment: Quality Assurance Analyst, WebCreek Technology, Texas.
- 2017 – 2019  **Andrew Keene**, MS. Thesis: *Probing Earth deformation in response to localized hydrologic mass loading, Susitna River Basin, Alaska*. URL: <https://scholarworks.umt.edu/etd/11337/>. Post-grad employment: Geophysicist, SM Energy, Colorado.

MS Committee Member

- 2021  **Chloe Boucher**, MS candidate, UM Geosciences.
-  **Noah Clayton**, MS candidate, UM Geosciences.
-  **Laura Stevens**, MS, UM Geosciences. Defense: 2 June 2021.
- 2020  **Kyara Nelson**, MS, UM School of Music. Defense: 29 April 2021.

Undergraduate Advising

- 2021 – 2022  **Tanessa Morris**, BS, UM Geosciences. Thesis project: *Estimating oceanic load tides in kinematic GNSS time series*.
-  **Reyer Fenoff**, BS, UM Geosciences. Thesis project: *Characterizing anomalously deep seismicity in western Montana's Swan Valley*.
- 2020 – 2021  **Ashlesha Khatiwada**, BS, UM Geosciences. Thesis title: *Analyzing the multipath of GPS time series to study snow properties*. URL: <https://scholarworks.umt.edu/utpp/352/>. Post-graduation employment: MS Candidate, University of Montana.
- 2020  **Amanda Kotila**, BS, UM Geosciences. Project title: *Estimating Moho depth in west-central Montana from seismic receiver functions*. Post-graduation employment: MS Candidate, University of Calgary, Canada.
-  **William (Andrew) Owen**, BS, UM Computer Science. Project title: *Estimating the magnitude-of-completeness of earthquake catalogs in western Montana*.
- 2019 – 2020  **Bryana McKay**, BS, UM Geosciences. Project title: *Re-location of anomalously deep seismicity beneath Swan Valley, western Montana*.
- 2019  **Ashlesha Khatiwada**, BS, UM Geosciences. Project title: *Identifying transient and anomalous signals in GPS time series in Alaska*.
- 2018 – 2019  **Bodhi Landry-Stahl**, BA, UM Physics/Astronomy. Project title: *Refining ocean tide models in the Puget Sound using GPS observations of ocean tidal loading*. Post-graduation employment: Physics Educator, Lydian Academy, San Francisco, California.
-  **Eric Dennison**, BA, UM Physics/Astronomy. Project title: *Refining Earth structure in South America using GPS observations of ocean tidal loading*.
- 2017 – 2020  **Cody Norberg**, BA, UM Physics/Astronomy. Thesis: *Exploring effects of GPS processing on atmospheric and hydrologic pressure-induced crustal responses*. URL: <https://scholarworks.umt.edu/utpp/278/>. Additional project: *Gravity, tilt, and strain response to surface mass loading*. Post-grad employment: Astronomer, Teton Skies, Wyoming.
- 2017  **Tommy Colligan**, BA Physics. Project title: *Investigating the Capabilities of GPS for Kinematic Analysis on a High-Altitude Balloon*.

Students Involved in Fieldwork for the UM Seismic Network

- 2022  **Brett Steck**, graduate, Geosciences.

Research Advising (continued)

- 2021
 - 📖 Tanessa Morris, undergraduate, Geosciences.
 - 📖 Reyer Fenoff, undergraduate, Geosciences.
 - 📖 Ashlesha Khatiwada, graduate, Geosciences.
 - 📖 Matthew Swarr, graduate, Geosciences.
 - 📖 Courtenay Duzet, graduate, Geosciences.
- 2020
 - 📖 Courtenay Duzet, graduate, Geosciences.
 - 📖 Amanda Kotila, undergraduate, Geosciences.
- 2019
 - 📖 Supanut Suntikoon, graduate, Geosciences.
 - 📖 Bryana McKay, undergraduate, Geosciences.
 - 📖 Anthony Joyce, undergraduate, Geosciences.
 - 📖 Cody Norberg, undergraduate, Physics.
- 2018
 - 📖 Mason Perry, graduate, Geosciences.
 - 📖 Ellen Smith, graduate, Geosciences.
 - 📖 Cody Norberg, undergraduate, Physics.
- 2017
 - 📖 Andrew Keene, graduate, Geosciences.
 - 📖 Ellen Smith, graduate, Geosciences.
 - 📖 Ashlesha Khatiwada, undergraduate, Geosciences.

Students and Postdocs Involved in Fieldwork for Hydrogeodesy (NSF-Funded)

- 2022
 - 📖 Eleanor Serviss, graduate, Geosciences.
- 2021
 - 📖 Alissa White, postdoc, Geosciences.
 - 📖 Lia Lajoie, postdoc, Geosciences.
 - 📖 Tanessa Morris, undergraduate, Geosciences.
 - 📖 Brett Oliver, graduate, Geosciences.
 - 📖 Ashlesha Khatiwada, graduate, Geosciences.
 - 📖 Matthew Swarr, graduate, Geosciences.
- 2020
 - 📖 Lia Lajoie, postdoc, Geosciences.
 - 📖 Mason Perry, graduate, Geosciences.
 - 📖 Noah Clayton, graduate, Geosciences.
 - 📖 Gina Belair, graduate, Geosciences.
 - 📖 Ashlesha Khatiwada, undergraduate, Geosciences.
- 2019
 - 📖 El Knappe, graduate/postdoc, Geosciences.
 - 📖 Mason Perry, graduate, Geosciences.

Student Awards & Achievements

- 2023
 - 📖 **Ashlesha Khatiwada**, MS Geosciences. *Outstanding Teaching Assistant*, National Association of Geoscience Teachers (NAGT).
- 2022
 - 📖 **Reyer Fenoff**, BS Geosciences. *Best Poster in the Physical Sciences Award*, UM Conference on Undergraduate Research, April 2022.
- 2021
 - 📖 **Courtenay Duzet**, MS Geosciences. *Graduate Fellowship*, Montana Space Grant Consortium, NASA. Award: \$11,000 graduate stipend + tuition and fees.
 - 📖 **Courtenay Duzet**, MS Geosciences. *Tobacco Root Geological Society Scholarship*.

Research Advising (continued)

- 2020
 - **Ashlesha Khatiwada**, BS Geosciences. *Best Poster in the Physical Sciences Award*, UM Conference on Undergraduate Research, April 2021.
 - **Ashlesha Khatiwada**, BS Geosciences. *Undergraduate Research Award*, University of Montana, April 2021.
 - **Courtenay Duzet**, MS Geosciences. *Geosciences Student Research Award*, University of Montana Department of Geosciences, April 2021.
 - **Baleigh Doyle**, PhD Geosciences. *Geodesy Internship: using satellite imagery to assess snow properties*, NASA Goddard Institute for Space Studies (GISS).
 - **Courtenay Duzet**, MS Geosciences. *Research Scholarship*, Montana Geological Society.
 - **Courtenay Duzet**, MS Geosciences. *Science Communication Internship*, UNAVCO Student Internship Program (USIP).
 - **Courtenay Duzet**, MS Geosciences. *Research Scholarship*, Research and Creative Scholarship Fund (RCSF), U. Montana.
- 2020
 - **Cody Norberg**, BA Physics. *Senior Seminar*, UM Department of Physics/Astronomy. 7 February 2020.
 - **Bryana McKay**, BS Geosciences. *Accepted Abstract*, National Conference on Undergraduate Research. Conference cancelled due to COVID-19.
 - **Cody Norberg**, BA Physics. *Accepted Abstract*, National Conference on Undergraduate Research. Conference cancelled due to COVID-19.
 - **William (Andrew) Owen**, BS Computer Science. *Summer Internship*, Montana Space Grant Consortium.
 - **Amanda Kotila**, BS Geosciences. *Summer Internship*, Montana Space Grant Consortium.
 - **Bodhi Landry-Stahl**, BA Physics. *Senior Seminar*, UM Department of Physics/Astronomy. 5 April 2019.
- 2019
 - **Bryana McKay**, BS Geosciences. *Summer Internship*, Montana Space Grant Consortium.
 - **Ellen Smith**, MS Geosciences. *Research Scholarship*, UM Department of Geosciences.
- 2018
 - **Cody Norberg**, BA Physics. *ARES Scholarship*, Montana Space Grant Consortium.
 - **Cody Norberg**, BA Physics. *Summer Internship*, Montana Space Grant Consortium. Title: *Modeling surface mass load displacements along the Columbia River basin*.
 - **Andrew Keene**, MS Geosciences. *Graduate Fellowship*, Montana Space Grant Consortium, NASA. Award: \$9000 graduate stipend + tuition and fees.
- 2017
 - **Cody Norberg**, BA Physics. *ARES Scholarship*, Montana Space Grant Consortium.
 - **Tommy Colligan**, BA Physics. *ARES Scholarship*, Montana Space Grant Consortium.

Teaching Supervision

- 2018
 - **Chelsea Leven**, MS Forestry, UM Learning Assistant, GEO 107N: Natural Disasters.
- 2017 –
 - **Teaching Assistants**, UM Geosciences.

Service

Paper Reviews

- 2023
 - Geophysical Journal International.
- 2022
 - Journal of Geophysical Research: Solid Earth (x2), Journal of Geodesy (x2), Geophysical Journal International.

Service (continued)

- 2021 ■ Earth & Planetary Science Letters (x2), Journal of Geophysical Research: Solid Earth (x2), Journal of Geodesy (x2), Geophysical Journal International (x2).
- 2020 ■ Journal of Geophysical Research: Solid Earth, Geophysical Research Letters, Earth & Planetary Science Letters, Journal of Geodesy, Geophysical Journal International.
- 2019 ■ Geophysical Journal International (x2), Journal of Geodesy, Bulletin of Geodetic Science, Geodesy & Geodynamics, MDPI Sensors.
- 2016 – 2018 ■ Geophysical Journal International, Remote Sensing, Marine Geodesy.

Proposal Reviews

- 2023 ■ NSF, **Frontier Research in Earth Sciences**, Ad Hoc Review.
- 2021 ■ NSF, **Frontier Research in Earth Sciences**, Ad Hoc Review.
■ NASA, **New (Early Career) Investigator Program**, Panel Review. 11-13 January.
- 2020 ■ NSF, **Hydrological Sciences**, Ad Hoc Review.

Academia

- (2024) ■ **Computational Infrastructure for Geodynamics (CIG) Crustal Deformation Modeling Workshop**, Program Committee. June 2024, Colorado School of Mines, CO, USA. Co-sponsored by the Southern California Earthquake Center (SCEC).
- 2023 ■ **Plenary Session Co-Chair**, 2023 GAGE/SAGE Workshop, Pasadena, California. Session: Evolving Landscape and Climate. Co-Chair with Marine Denolle (University of Washington).
- 2022 ■ **NASA Solid Earth Team (SET) Workshop**, Science Organizing Committee. November 2022, La Jolla, CA, USA.
■ **EarthScope (IRIS/UNAVCO) Transition Nominating Committee (ETNC)**, May–August 2022. Elected to serve on behalf of the UNAVCO community.
- 2021 – 2022 ■ **GAGE/SAGE Science Workshop**, Science Organizing Committee, Science Committee members: 4. Workshop held June 2022 in Pittsburgh, PA, USA.
- 2021 – ■ **Executive Committee**, Geodesy Section, American Geophysical Union.
- 2021 ■ **Primary Liaison and Session Co-Convener**, Geodesy Section, Session Topic: Hydrogeodesy, American Geophysical Union Fall Meeting 2021.
- 2018 – 2022 ■ **Outstanding Student Paper Award (OSPA) Judge**, Geodesy Section, American Geophysical Union Fall Meeting. (2018, 2019, 2020, 2021, 2022).
- 2018 – 2021 ■ **Outstanding Student Paper Award (OSPA) Coordinator**, Geodesy Section, American Geophysical Union Fall Meeting. [Committee Chair in 2020]
- 2021 ■ **Reviewer of Proposals for Student Awards and Scholarships**, Geological Society of America (GSA) Quaternary Geology and Geomorphology Division.
- 2019 – 2020 ■ **Reviewer of Student Travel Grant Applications**, Geodesy Section, American Geophysical Union Fall Meeting.
- 2020 ■ **NASA A-Team Study, Enceladus Geodesy**. 2-3 June 2020.
- 2017 – 2018 ■ **GNSS Data Products Sub-Committee**, UNAVCO.

University

- 2023 ■ **Presentation Judge**, University of Montana Conference on Undergraduate Research (UMCUR). 21 April 2023.

Service (continued)

- 2022 – 2023  **Search Committee: Tenure Track Faculty Positions in Astrophysics/Astronomy (x2)**, UM Department of Physics and Astronomy.
- 2020 –  **Primary Institutional Representative**, UNAVCO / EarthScope Consortium.
- 2019 –  **Undergraduate Research and Creative Scholarship Committee**
 *Chair*, Fall 2022 – Spring 2023.
 *Member*, Fall 2019 – present.
- 2022 – 2023  **Open Educational Resources (OER) Institute**, American Association of Colleges and Universities (AAC&U). One of five representatives from UM.
- 2021  **Search Committee: UM Provost and Executive Vice President**. Nominated to serve by UM President's Office.
- 2020 – 2022  **General Education Ad Hoc Committee**. Charged by the Executive Committee of the Senate (ECOS) with developing and proposing a re-envisioned general education curriculum at UM.
- 2020 – 2021  **University Design Team**. Nominated to serve by UM President's Office.
 Final Report: <https://www.umt.edu/president/udt/finalreport.php>
- 2020 – 2021  **Curriculum Committee Chair**, Franke Global Leadership Initiative, U. Montana.
- 2021  **Guest Consultant**, Davidson Honors College General Education Program, 3/29/21.
 **Guest Panelist, Scholarship Bootcamp**, Davidson Honors College, 2/17/21.
- 2020 – 2022  **Co-Presenter**, *Lowering Textbook Costs: Getting Started with Open Educational Resources (OER)*, Office for Organizational Learning and Development (OOLD). Fall 2020, 2021, 2022.
- 2020  **Distinguished Alumni Awards Committee**, Davidson Honors College, U. Montana.
 **Women in Science Representative**, Geosciences, U. Montana.
 **Marketing, Slogan, and Vision Statement Design**, College of Humanities & Sciences, U. Montana. 14 December 2020.
- 2017 – 2020  **Faculty Senate**, U. Montana.
- 2019 –  **Undergraduate Research Advisory Council**, U. Montana.
- 2018 – 2021  **Oversight Board, Franke Global Leadership Initiative**, U. Montana.
- 2019  **Outstanding Service to Campus Community Award Committee**. Nominated to serve by UM President's Office.
- 2018 –  **UK Prestigious Scholarships Committee and Interview Panel**, U. Montana.
- 2016 –  **Scholarship Coaching**, Personalized coaching of students in application/interview process for prestigious fellowships (e.g., Marshall, Goldwater, Gates-Cambridge).
- 2017 – 2018  **Steering Committee for Advancing Computational Infrastructure**, U. Montana.
- 2016 – 2020  **Goldwater Scholarship Committee**, U. Montana.
- 2017 – 2020  **Presidential Leadership Scholarship Committee**, U. Montana.
- 2019  **Outreach to Prospective Students**, U. Montana.
 **Search Committee: Dean of the Davidson Honors College**, U. Montana.
- 2018  **Search Committee: Director of UM Summer Programs**, U. Montana.
 **Prestigious External Fellowships Panel**, U. Montana.
- 2017  **Advisory Board and Friends Dinner**, Davidson Honors College, U. Montana.
 **Open House and Information Session for Outstanding High-School Students**, Davidson Honors College, U. Montana.
 **University Scholar Reception**, Davidson Honors College, U. Montana.

Service (continued)

- 2017 – 2018 **Contributor, Davidson Stewardship Packet**, Davidson Honors College.
- 2017 – 2018 **Prestigious External Fellowships Presentation**, 18 April 2017. UM Writing Center and Davidson Honors College. U. Montana.
- 2017 – 2018 **Violinist, UM President’s Faculty & Staff Holiday Reception**, U. Montana.
- 2017 – 2018 **UM Research & Creative Scholarship Fund (RCSF) Committee**, U. Montana.

Department

- 2022 **Faculty Evaluation Committee**, Fall 2022.
- 2021 – **Director of Undergraduate Studies**
- 2019 – **Graduate Admissions Committee**. Committee Chair: 2021.
- 2022 **Coordinator of Geosciences display at UM WelcomeFest**, September 2022.
- 2021 **New-Student Welcome Event**, Department of Geosciences, 8/28/21.
- Departmental planning workshop (participant)**, 4/2/21, 4/9/21.
- Presentation on Generic Mapping Tools**, Graduate Workshop, 4/5/21.
- Outreach to prospective undergraduate students**, phone calls and emails.
- 2019 – 2020 **Management of Department Website and Promotional Materials**.
- 2020 **Department/University Liaison**, IRIS-UNAVCO Request for Information (RFI) for hosting a future geophysical facility in Missoula, Montana.
- Organization of Weekly Department Lunch**.
- 2017 – 2019 **UM Days Representative**.
- 2018 – 2019 **Design of Museum-Style Science Displays**, Clapp Building, University of Montana.
- 2017 – 2018 **Undergraduate Academic Advisor**. Approximately 8-10 advisees per semester.
- 2018 **Guest Lecturer**, GEO 103N (Environmental Geology), 24 September 2018.
- Mortar Board Outstanding Senior Recognition Ceremony**. 11 May 2018.
- Drafted Updated Role Description for Computer Support Specialist III**.
- 2017 **Community Giving Campaign**, Department Coordinator, Fall 2017.

Community

- 2023 **We are Montana in the Classroom**, Visit to Hamilton Middle School, 11 May 2023. Presentation and interactive activities with an all-girls engineering class. Teacher: Stephanie DeBiasio.
- Bringing the U to You Lecture Series**, Great Falls, Montana. 9 March 2023.
- 2022, 2023 **Missoula Senior Forum**, Presentations (x2) on Montana earthquakes and water resources to a group of local senior citizens.
- 2018 – 2019 **Engineer That, Girl!**, Girl Scouts Expo to engage primary school girls in STEM fields.
- 2017 – 2019 **Music performances (violin)**, Missoula Community Chorus and chamber ensembles.
- 2018 **High-School Science Fair Mentor**, Sentinel High School.
- UM Seismology Lab Tour**, Sentinel High School Advanced Problems in Science.
- 2017 **Backroads of Montana**, Montana PBS. Consultant, April 2017.

Skills

- Languages **📖** English (fluent, native language), German (basic).
- Coding **📖** Python, Bash, Linux CLI, L^AT_EX, GMT, Matlab, GipsyX.
- Misc. **📖** Academic research, teaching, training, consultation, project management, field operations.

Professional Development

Research & Technology

- 2021 **📖** **Best Practices for Seismic Posthole Emplacement**, Webinar, IRIS. 28 January 2021.
- 2020 **📖** **Machine Learning for the Environmental and Geosciences**, Full-day tutorial, AGU Fall Meeting 2020.
- 2019 **📖** **Inverse Theory**, ETH Zürich, Switzerland. Sept. 2019. Instructor: Malcom Sambridge.
📖 **Salvus Software**, ETH Zürich, Switzerland. 23-24 Oct. 2019. Instructor: Christian Boehm.
- 2016 **📖** **USArray Short Course**, Incorporated Research Institutions for Seismology (IRIS). 1-5 August 2016. Northwestern University, Chicago, Illinois.
📖 **Underworld2 Finite-Element Computing for Geodynamics Workshop**. 16 June 2016. Pasadena, California.
📖 **High-Performance Computing in the Cloud with Amazon Web Services**, Caltech. 4 May 2016. Pasadena, California.
- 2015 **📖** **NVIDIA GPU Computing Workshop**, Caltech. February 2015. Pasadena, California.
- 2012 **📖** **Crustal Deformation Modeling Workshop**, Computational Infrastructure for Geodynamics (CIG). June 2012. Colorado School of Mines, Golden, Colorado.
- 2011 **📖** **Enceladus Focus Group Meeting**, SETI Institute. May 2011. Mountain View, California.
- 2009 **📖** **European Seismological Commission Annual Workshop**. September 2009. Pico Island, Azores, Portugal.
📖 **Cassini Project Science Group Meeting**. June 2009. University College London / Birkbeck, London, UK.

Management & Leadership

- 2021 **📖** **Practical Leadership Skills for Managers**, U. Montana. February-August 2021. *Digital badge* issued by University of Montana in August 2021 via Credly.
📖 **:: Supporting Employee Success**, LinkedIn Learning
📖 **How Managers Can Support Employee Success**, 2/22/21.
📖 **:: Building Inclusive and Thriving Teams**, LinkedIn Learning
📖 **Building an Inclusive Work or Learning Environment**, 3/24/21.
📖 **:: Promoting Accountability and Effectiveness**, LinkedIn Learning
📖 **Creating a Culture of Purpose and Accountability in Your Unit**, 4/28/21.
📖 **:: Providing Feedback through Coaching**, LinkedIn Learning
📖 **Approaching Difficult Conversations**, 5/24/21.
📖 **:: Communicating With Your Team**, LinkedIn Learning
📖 **New Ways to Meet**, 6/23/21.
📖 **:: Recruiting and Retaining Employees**, LinkedIn Learning
📖 **Supervising Staff for Success**, 7/14/21.
- 2021 **📖** **Campus Security Authority (CSA) Training**, Clery Act Compliance, 5/20/21.

Professional Development (continued)

- 2019 **Understanding and addressing implicit bias**, U. Montana. 8 February 2019.
- Managing Research Projects**, ETH Zürich, Switzerland. September 2019. Instructor: Brian Kennett.
- 2016 – 2017 **Pacific-Northwest Circle of Success: Mentoring Opportunities in STEM (PNW-COSMOS) Indigenous Mentoring Program (IMP)**, NSF-sponsored training program. Nine training modules. U. Montana.
- 2016 **The Mentoring Effect: Conference on Mentoring Undergraduate Researchers**, Caltech. May 2016. Pasadena, California.

Teaching & Communication

- 2021 **Campus Security Authority (CSA) Training**, May 2021.
- 2019 **PDF Document Accessibility**, September 2019. Instructor: Theresa Keenan, UM Mansfield Library.
- OER@UMT: Grant opportunity for faculty seeking free, adaptable instructional resources**, 6 February 2019.
- 2018 **Communicating Science for Impact**, UNAVCO Short Course. March-June 2018. Instructors: Beth Bartel, Wendy Bohon, and Maite Agopian.
- Making the most of Moodle: Innovative on-line course design**, University of Montana. 24 October 2018.
- 2017 **Advisor Toolkit Training**, University of Montana.
- 2009 **Student Associates Scheme**, Institute of Education, University College London. January–June 2009. Competitive program providing training for prospective teachers.

Select Media Appearances

Research

- 2021 **UM Press Release**, May 2021. NASA Earth Surface and Interior grant. URL: <https://www.umt.edu/news/2021/05/050121nasa.php>.
- 2020 **UM Press Release**, June 2020. NSF Frontier Research in Earth Sciences grant. URL: <http://hs.umt.edu/geosciences/stories-folder/watershed-research.php>.
- 2016 **Geophysical Journal International Student Author Award**. URLs: <https://aandg.org/sections/news/congratulations-hilary> and <https://academic.oup.com/astrogeo/article/57/6/6.10/2698960>.

Teaching & Outreach

- 2020 **Alumni Story Project**, Davidson Honors College, U. Montana.
- Faculty Profile**, UM Office of Strategic Communications.
- 2018 **Feature Article, UM Today**, Topic: Marshall Scholars who are UM Alumni. UM Relations.
- 2017 **University of Montana Alumni Stories**, Spring 2017. Title: *Griz Alumni Return as Geoscience Faculty*. URL: <https://medium.com/university-of-montana/griz-alumni-return-as-geoscience-faculty-cda2ad6730af>.
- UM College of Humanities and Sciences Spring Newsletter**, Spring 2017. Title: *The Student Becomes the Teacher*.
- DHC Alumni and Friends Newsletter**, Fall 2017. Featured as: *Exceptional Alumna of the DHC*.

Professional Memberships

- American Geophysical Union
- European Geophysical Union
- Association of Marshall Scholars
- UNAVCO Consortium
- Council on Undergraduate Research (USA)