

Sarah Aarons
Assistant Professor
Scripps Institution of Oceanography University of California San Diego
smaarons@ucsd.edu

Education

2016 University of Michigan, Ph.D., Geology
2012 University of Michigan, M.S., Earth and Environmental Sciences
2009 Stanford University, B.S., Geological and Environmental Sciences

Professional Positions

2019-present Scripps Institution of Oceanography, University of California San Diego Assistant Professor
2017-2019 Department of Geophysical Sciences, University of Chicago Postdoctoral Fellow
2016-2017 Department of Earth System Science, University of California, Irvine Postdoctoral Fellow
2010-2016 Department of Earth and Environmental Sciences, University of Michigan Graduate Student

Honors & Awards

2024 Co-author of the Climate Trends chapter of the Fifth National Climate Assessment (NCA5)
2024 Inclusive Excellence Award for Marine Sciences at UC San Diego (given to members of the Scripps Ad Hoc Task Force on Space Allocation)
2023 F.W. Clarke Award, Geochemical Society
2022 Scripps Institution of Oceanography Graduate Teaching Award
2021 Doris M. Curtis Outstanding Woman in Science Award, Geological Society of America
2021 American Geophysical Union Editors' Citation for Excellence in Refereeing
2019 Kavli Fellow, National Academy of Sciences
2018 National Center for American Indian Enterprise Development 40 under 40 Award 2017 Ford Foundation Postdoctoral Fellowship
2016 UC Irvine Chancellor's ADVANCE Postdoctoral Fellowship

Funded Grants

2024 NSF Chemical Oceanography Award #2421815 (lead-PI in proposal "Collaborative Research: Testing stable zirconium isotope variability in the ocean")
2023 UC San Diego Academic Senate Marine Sciences Research Application "Zirconium isotopes as a potential new tracer of ocean circulation"
2021 NSF OPP Award #2035580 (lead-PI in proposal "Collaborative Research: Peripheral East Antarctic ice as a unique recorder of climate variability during the Last Interglacial")
2021 NSF STC Award #2019710 (funded collaborator in "STC: Center for OLDest Ice Exploration")
2020 NSF EAR Award #1946856 (co-PI in proposal "Collaborative research: Controls of climate and dust on soil chemical erosion and nutrient supply")
2020 UCSD, Office of Research Affairs, Office for Equity, Diversity & Inclusion, Office of the Chancellor (Innovation Grants for Inclusive Research Excellence)

†= student author
 ††=primary PhD advisee
 †††=primary undergraduate or MS advisee
 §= postdoc author

Publications—In progress

35. Hu, K.†, Ferrier, K.L., **Aarons, S.M.**, Norris, E.††, Blankenship, R.†, Marcott, S., Breunig, R., Reutenik, G., Peters, I., Ceperley, E., Sensitivity of soil erosion rate to climate and dust along a 2.8-km elevation transect at San Jacinto Mountain, California, *Journal of Geophysical Research-Earth Surface*, in review.

34. Anderson, E., Begay, R.L., Hurley, E., Tsosie, R., Tsinajinnie, L., Yusuf, M.A.A., Crocker, K.C., Bos, K., Leonard, K., David-Chavez, D., Milligan-McClellan, K., Small-Rodriguez, D., **Aarons, S.M.**, Jennings, L., Cid, X., Johnson, K.R., Alegado, R.A., Russo Carroll, S., Liboiron, M., Gomez, A.M., A Letter from your Academic Aunties, *Native American and Indigenous Studies (NAIS) Journal*, in review.

33. Ling, E. †††, **Aarons, S.M.**, Zhang, Z.†, Huang, L. ††, Johnson, A.C., Dauphas, N., Ibañez-Mejia, M., Titanium isotopic insights into partial melting versus magma mixing in the Aleutian Arc, *Geochimica et Cosmochimica Acta*, in review.

32. Shackleton, S., Hishamunda, V., Yan, Y., Carter, A.J.††, Morgan, J., Severinghaus, J.P., **Aarons, S.M.**, Marks Peterson, J., Epifanio, J., Buizert, C., Brook, E.J., Kurbatov, A.V., Bender, M.L., Higgins, J.A., Global ocean heat content over the past 3 million years, *Nature*, in revision.

31. Norris, E.D.††, Bailet, J., Ma, Y., Goswami, A.†††, **Aarons, S.M.**, Benmarhnia, T. Differential Health Impacts of Short-term Particulate Matter Exposure in Arid and Semi-Arid Regions: A Scoping Review, *Geohealth*, in review.

30. Carter, A.J. ††, **Aarons, S.M.**, Schnaubelt, J.C., Tabor, C.R., Higgins, J.A., Shackleton, S.A., Epifanio, J.A., Morgan, J.D., Koornneef, J.M., Davies, G.R., Gabrielli, P., Choi, A.†, Severinghaus, J.P., Brook, E.J., Introne, D., Marks Peterson, J.C., Sutter, J. Evidence for diminished Ross Ice Shelf and West Antarctic Ice Sheet during the Last Interglacial at the Allan Hills, Antarctica, *Nature Geoscience*, in revision.

Publications—Peer Reviewed

29. Forsch, K.§, Ruacho, A., **Aarons, S.M.**, Tidewater cycle drives alpine glacial sediment plume geochemistry, *Nature Communications*, accepted.

28. Norris, E.††, **Aarons, S.M.**, Hu, K.†, Ferrier, K.L., Blankenship, R.†, Goswami, A. †††, Han, J. †††. Disentangling Natural and Anthropogenic Source of Dust to a Montane Ecosystem at San Jacinto Peak, Southern California, *Journal of Geophysical Research-Atmospheres*, in press.
<https://doi.org/10.1029/2025JD043322>.

27. Shackleton, S., Hishamunda, V., Davidge, L., Marks Peterson, J., Brook, E.J., Carter, A.J.††, Yan, Y., Morgan, J., Epifanio, J., Neff, P., **Aarons, S.M.**, Kurbatov, A.V., Introne, D.S., Steig, E.J., Schauer, A.J., Buizert, C., Severinghaus, J.P., Bender, M.L., Higgins, J.A., Miocene and Pliocene ice and air from the Allan Hills blue ice area, East Antarctica, *Proceedings of the National Academy of Sciences*, in press.

26. Sedlak, J.A.†, Vishnoi, M., Forsch, K.§, Bhadha, P., **Aarons, S.M.**, Grassian, V.H. Probing Interactions at the Organic–Inorganic Interface of Biomass Burning Aerosol: Reactivity of Organic Tracer Species with Different Iron Oxide Mineral Phases, *ACS Earth and Space Chemistry*, 8(12), 2463–2473, 2024.
25. Brahney, J., Heindel, R.C., Gill, T.E., Carling, G., Gonzalez-Olalla, J.M., Hand, J., Mallia, D.V., Munroe, J., Perry, K., Putman, A.L., Skiles, M., Adams, B.R., Aanderud, Z., **Aarons, S.**, Aguirre, D., Ardon-Dryer, K., Blakowski, M.B., Creamean, J.M., Fernandez, D., Foroutan, H., Gaston, C., Hahnenberger, M., Hoch, S., Jones, D.K., Kelly, K.E., Lang, O.I., LeMonte, J., Reynolds, R., Singh, R., Sweeney, M., Merrill, T. Dust in the Critical Zone, *Earth Science Reviews*, 258, 104942, 2024.
24. Huang, L. ††, **Aarons, S.M.**, Koffman, B., Munk, L.A., Jenkes, J., Norris, E.††, Arendt, C.A., The role of source, mineralogy, and organic complexation on lability and Fe isotopic composition of Fe sources to the Gulf of Alaska, *ACS Earth and Space Chemistry*, 8(8), 2024.
23. Marvel, K., W. Su, R. Delgado, **S. Aarons**, A. Chatterjee, M.E. Garcia, Z. Hausfather, K. Hayhoe, D.A. Hence, E.B. Jewett, A. Robel, D. Singh, A. Tripathi, and R.S. Vose, 2023: Ch. 2. Climate trends. In: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. <https://doi.org/10.7930/NCA5.2023.CH2>.
22. Prissel, K.B., Krawczynski, M.J., Nie, N.X., Dauphas, N., **Aarons, S.M.**, Heard, A.W., Hu, M.Y., Alp, E., Zhao, J., Iron, titanium, and magnesium isotopic evidence for diffusion-limited reaction of lunar magma ocean cumulates in mare basalt source regions, *Geochimica et Cosmochimica Acta*, 372, 154-170, 2024.
21. Huang, L. ††, Tissot, F.L.H., Ibañez-Mejia, M., Forsch, K. §, Arendt, C. Choy, C.A., **Aarons, S.M.**, High-precision zirconium isotope analysis of Pacific seawater reveals large mass-dependent fractionations in the ocean, *Geochimica et Cosmochimica Acta*, 365, 202-214, 2024.
20. Zhang, Z.†, Dauphas, N., Johnson, A.C., **Aarons, S.M.**, Bennett, V.C., Nutman, A.P., MacLennan, S., Schoene, B., Titanium and iron isotopic records of granitoid crust production in diverse Archean cratons, *Earth and Planetary Science Letters*, 620, 118342, 2023.
19. **Aarons, S.M.**, Dauphas, N., Greber, N.D., Roskosz, M., Bouchez, J., Carley, T., Liu, X.-M., Rudnick, R.L., Gaillardet, J., Titanium transport and isotopic fractionation in the Critical Zone, *Geochimica et Cosmochimica Acta*, 352, 175-193, 2023.
18. Maltz, M.R., Carey, C.J. Freund, H., Botthoff, J., Stajich, J.E., Hart, S.C., **Aarons, S.M.**, Aciego, S.M., Blakowski, M.A., Dove, N.C., Barnes, M., Pombubpa N., Aronson E.L., Landscape topography and regional drought alters dust microbiomes in the Sierra Nevada of California, *Frontiers in Microbiology*, <https://doi.org/10.3389/fmicb.2022.856454>, 2022.
17. **Aarons, S.M.**, Johnson, A.C., Rader, S.T., Forming Earth’s continental crust: A non-traditional stable isotope perspective, invited article for *Elements*, 17 (6), <https://doi.org/10.2138/gselements.17.6.413>, 2021.
16. **Aarons, S.M.**, Dauphas, N., Zeng, Z., Blanchard, M., Nie, N.X., Greber, N.D., Johnson, A.C., Clues from *ab initio* calculations on titanium isotopic fractionation in tholeiitic and calc-alkaline

magma series, *ACS Earth and Space Chemistry*,
<https://doi.org/10.1021/acsearthspacechem.1c00172>, 2021.

15. Nie, N.X., Dauphas, N., Alp, E.E., Zeng, H., Sio, C.K., Hu, J.Y., **Aarons, S.M.**, Zhang, Z., Tian, H.-C., Prissel, K.B., Greer, J., Bi, W., Hu, M.Y., Zhao, J. Shahr, A., Roskosz, M., Teng, F.-Z., Krawczynski, M.J., Heck, P.R., Spear, F.S., Fe, Mg, and Ti isotopic fractionations between garnet, ilmenite, fayalite, biotite, and tourmaline: comparison between NRIXS, ab initio, and study of mineral separates from the Moosilauke metapelite, *Geochimica et Cosmochimica Acta*, 302, 18-45, 2021.

14. Heard, A.W., **Aarons, S.M.**, Hofmann, A., He, X., Ireland, T., Bekker, A., Qin, L., Dauphas, N. Anoxic continental surface weathering conditions in the Mesoarchean Pongola Supergroup, South Africa, *Geochimica et Cosmochimica Acta*, 295, 1-23, 2021.

13. **Aarons, S.M.**, Reimink, J.R., Greber, N.D., Heard, A.W., Zhang, Z., and Dauphas, N., Titanium isotopes constrain a magmatic transition at the Hadean-Archean boundary in the Acasta Gneiss Complex, *Science Advances*, 6, eabc9959, 2020.

12. **Aarons, S.M.**, Arvin, L., Aciego, S.M., Riebe, C.S., Johnson, K.R., Blakowski, M.A., Koornneef, J., Hart, S.C., Barnes, M., Dove, N., Maltz, M., Botthoff, J., and Aronson, E., Competing droughts affect dust delivery to Sierra Nevada, *Aeolian Research*, 41, 100545, 2019

11. Johnson, A.C., **Aarons, S.M.**, Dauphas, N., Nie, N.X., Zeng, H., Helz, R.T., Romaniello, S.J., Anbar, A.D., Titanium Isotopic Fractionation in Kilauea Iki Lava Lake Driven by Oxide Crystallization, *Geochimica et Cosmochimica Acta*, 264, 180-190, 2019.

10. **Aarons, S.M.**, McConnell, J., Delmonte, B., Baccolo, G., Aciego, S.M., Dust transport to the Taylor Glacier, Antarctica during the last interglacial, *Geophysical Research Letters*, doi:10.1029/2018GL081887, 2019.

9. Arendt, C.A., Aciego, S.M., Sims, K.W.W., **Aarons, S.M.**, Seasonal Progression of Uranium Series Isotopes in Subglacial Meltwater: Implications for Subglacial Storage, *Chemical Geology*, 467, 42-52, 2017.

8. **Aarons, S.M.**, Blakowski, M.A., Aciego, S.M., Stevenson, E.I., Sims, K.W.W., Scott, S., Aarons, C., Geochemical characterization of critical dust source regions in the American West, *Geochimica et Cosmochimica Acta*, 215, 141-161, 2017.

7. Chellman, N., McConnell, J., Arienzo, M., Pederson, G., **Aarons, S.M.**, Csank, A., Reassessment of the chronology of the Upper Fremont Glacier ice cores by synchronizing ice core water isotopes and tree ring widths, *Environmental Science and Technology*, 51 (8), 4230-4238, 2017.

6. **Aarons, S.M.**, Aciego, S.M., Arendt, C.A., Steigmeyer, A., Gabrielli, P., Sierra-Hernandez, R., Delmonte, B., Baccolo, G., Pratt, K., May, N., Dust composition changes from Taylor Glacier (East Antarctica) during the last glacial-interglacial transition: A multi-proxy approach, *Quaternary Science Reviews*, 162, 60-71, 2017.

5. Aciego, S.M., Riebe, C.S., Hart, S.C., Blakowski, M.A., Carey, C., **Aarons, S.M.**, Dove, N., Aronson, E., Dust outpaces bedrock in nutrient supply to montane forest ecosystems, *Nature Communications*, 8, doi:10.1038/ncomms14800, 2017.

4. **Aarons, S.M.**, Aciego, S.M., Gabrielli, P., Delmonte, B., Koornneef, J.M., Uglietti, C., Wegner, A., Blakowski, M.A., Bouman, C., Ice core record of dust sources in the western United States over the last 300 years, *Chemical Geology*, 442, 160-173, 2016.
3. **Aarons, S.M.**, Aciego, S.M., Gabrielli, P., Delmonte, B., Koornneef, J., Wegner, A., Bouman, C., Addressing the impact of the Ross ice shelf retreat on local climate: characterization of mineral dust in the Taylor Dome ice core, East Antarctica, *Earth and Planetary Science Letters*, 444, 34-44, 2016.
2. Aciego, S.M., **Aarons, S.M.**, Sims, K.W.W., Short Communication: The Uranium-isotopic composition of Saharan dust collected over the central Atlantic Ocean, *Aeolian Research*, 17, 61-66, 2015.
1. **Aarons, S.M.**, Aciego, S.M., Gleason, J.D., Variable Hf-Sr-Nd radiogenic isotopic compositions in a Saharan dust storm over the Atlantic: Implications for dust flux to oceans, ice sheets and the terrestrial biosphere, *Chemical Geology*, 349, 18-26, 2013.

Recent Invited Talks

- 2025 University of Pennsylvania, Department of Earth and Environmental Science
- 2024 Columbia Climate School, Columbia University
- 2023 Point Loma Nazarene University, Perspectives on Science public lecture
- 2023 University of Hawai'i at Manōa, Department of Earth Sciences seminar
- 2023 University of New Hampshire, AURORA (Arctic Indigenous Understanding, Research, Outreach, Reciprocity, and Advancement) seminar
- 2023 Indiana University, Department of Earth and Atmospheric Sciences
- 2022 University of New Mexico, Department of Earth and Planetary Sciences
- 2022 DUST² Workshop (NSF Critical Zone Collaborative Network) keynote speaker
- 2022 University of Texas, Austin, UTIG
- 2022 California State University, Northridge, Department of Geological Science

Trainees Postdoctoral Scholars

1. Kiefer Forsch (NSF OCE Postdoctoral Fellow 2021-2024) *Topic*: Isotopic and microbial investigations of the iron geochemistry and bioavailability of glaciogenic particles

Students Mentored

2. Linqing Huang Ph.D. (2019-2024) *Topic*: Non-traditional stable isotope variability and Earth surface processes.
3. Austin Carter Ph.D. (2020-2025) *Topic*: Dust flux and compositional variations to Antarctica during the Last Interglacial and Mid-Pleistocene Transition.
4. Emmet Norris Ph.D. co-advised w/Prof. Tarik Benmarhnia (2020-2025) *Topic*: Natural and anthropogenic influences on particulate matter composition.
5. Emma Ling M.S. (2023-2024) *Topic*: Titanium Isotopes: Insight into Partial Melting, Fractional Crystallization and Magma Mixing along the Aleutian Arc
6. Anusha Goswami M.S. co-advised w/Prof. Tarik Benmarhnia (2024-2025) *Topic*: Wildfire-Induced Metal(loid) Toxicity and Mobility Risks in California
7. Justin Han (2024-2025) *Topic*: Zirconium Isotopic Composition of Riverine and Estuarine Systems

Courses

Winter 2021, 2022: Environmental Systems 102, The Solid and Fluid Earth Spring 2021: SIOG 249, Climate change impacts on Arctic Indigenous People Winter 2022: SIOG 269, The Black Box of graduate school; Hidden curriculum

Spring 2022: SIOG 269, Biogeochemical applications of traditional and non-traditional stable isotopes to diverse problems in Earth Science

Spring 2023: SIOG 242, Rates and Dates (Geochronology)

Fall 2023, 2024: SIO 30, The Oceans; SIO 108, Introduction to Paleoclimatology

Academic Service

Peer review:

2014-present: Manuscript Reviewer for journals including *Journal of Geophysical Research-Atmospheres*, *Journal of Geophysical Research-Oceans*, *Geophysical Research Letters*, *Environmental Science and Pollution Research*, *Global and Planetary Change*, *Earth and Planetary Science Letters*, *Chemical Geology*, *Quaternary Science Reviews*, *Quaternary Research*, *Climate of the Past*, *Nature Communications*, *Atmospheric Environment*, *Science*, *Paleoceanography and Paleoclimatology*, *Nature Geoscience*, *Science Advances*, *ACS Earth and Space Chemistry*

2020, 2021, 2022: Panelist for National Science Foundation

2020, 2021: Ad hoc proposal reviewer for National Science Foundation

National & International organizations:

2021-2022 Chapter Author for Climate Trends chapter of the Fifth National Climate Assessment (NCA5)

2021-2022 2022 Goldschmidt Theme Chair for Theme 10: Earth Surface Processes from Weathering to Climate Change

2021 Moderator for National Academy of Science organized “Identifying New Community-Driven Science Themes for NSF’s Support of Paleo Perspectives on Climate Change (P2C2)”

2020 Panelist, Ford Foundation Conference

2020-present Interagency Arctic Research Policy Committee (IARPC) Diversity and Inclusion Leadership team

2020 Invited participant, Geological Society of America Executive Committee meeting on Equity, Diversity, & Inclusion

2018 Session Convener, Goldschmidt Conference, Boston, MA

University Service:

2020-present Environmental Systems Program Advisory Committee, Scripps Institution of Oceanography

2019-present Ad hoc reviewer for faculty review

2019, 2020 Reviewer and panelist for University of California Presidential Postdoctoral Fellowship Program (PPFP)

2019-2020 Alternate for UCSD Representative Assembly Meetings (SIO representative)

2019-present Workshop facilitator at UC Presidential Postdoctoral Fellowship Program Fall & Spring meetings

Departmental Service:

2020-present Diversity Advisory Committee, SIO 2021-2022 Diversity Admissions Committee, SIO

2021-present Graduate Student admissions co-chair for Geosciences curricular group, SIO

2021-present SIO Space Committee

2023 Geosciences First Year Exam Committee, Scripps Institution of Oceanography (SIO)

2021 Geosciences First Year Exam Chair, Scripps Institution of Oceanography (SIO) 2020-

2021 Graduate Student Open House coordinator for Geosciences curricular group (SIO) 2020 Tectonics Faculty Search Committee