

# MELISA A. DIAZ

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## CURRENT APPOINTMENT

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### Postdoctoral Scholar, Woods Hole Oceanographic Institution

Geology and Geophysics; Applied Ocean Physics & Engineering

Advisors: Sarah Das, Catherine Walker, Chris German

Research topics: Salt and nutrient cycling in Arctic; Habitat suitability in cryosphere

Sep. 2020 –  
Current

## EDUCATION

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The Ohio State University, Columbus, OH

### Ph.D. in Earth Sciences

*Geochemistry of the Shackleton Glacier region, Antarctica and implications for glacial history, salt dynamics, and biogeography*

Advisor: W. Berry Lyons

2017 – 2020

The Ohio State University, Columbus, OH

### M.Sc. in Earth Sciences

*Spatial and temporal geochemical characterization of aeolian material from the McMurdo Dry Valleys, Antarctica*

Advisor: W. Berry Lyons

2016 – 2017

The University of Rochester, Rochester, NY

### B.S. in Earth and Environmental Sciences

Minors: Chemistry and Japanese

Advisor: Vasili Petrenko

2010 – 2014

## TEACHING EXPERIENCE

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Latinx Space for Enrichment and Research, Columbus, OH

### Hub Coordinator – Franklin Heights High School

Sep. 2018 –  
May 2020

The Ohio State University, Columbus, OH

### Guest Lecturer – Introduction to Oceanography

Mar. 2020

The Ohio State University, Columbus, OH

### Guest Lecturer – Antarctic Study Abroad Program

Nov. 2019

The Ohio State University, Columbus, OH

### Teaching Assistant – Earth Sciences 1100: Planet Earth

Jan. 2016 –  
Dec. 2016

Boy and Girls Club, Marlborough, MA

### Discovery Club Staff – After-school help for K-5<sup>th</sup> grade

Sep. 2014 –  
Apr. 2015

## **STUDENTS TRAINED AND ADVISED**

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Kat Zic, The Ohio State University, Undergraduate thesis under development, Working with the Metal Redlining Network	<b>2019 – ongoing</b>
Brianna Piergallini, The Ohio State University, Undergraduate thesis with research distinction, <i>Fe and Pb concentrations in McMurdo Dry Valleys stream deltas entering the Southern Ocean</i>	<b>2019 – 2020</b>
Caitlin Monagle, The Ohio State University, Undergraduate thesis with research distinction, <i>Spatial distribution of salts in the Namib Desert, Namibia</i>	<b>2018 – 2020</b>
Eli Lucas, The Ohio State University, Undergraduate thesis, <i>Concentration-discharge relationships in the Cuyahoga and Maumee Rivers</i>	<b>2018 – 2020</b>

## **PREVIOUS RESEARCH APPOINTMENTS**

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Lyons Group- Environmental Geochemistry, Byrd Polar and Climate Research Center, The Ohio State University, Columbus, OH With W. Berry Lyons, Chris Gardner, Sue Welch, Kathleen Welch <b>Research Associate</b>	<b>Sep. 2015 – Jan. 2016</b>
Rochester Ice Core Lab, University of Rochester, Rochester, NY With Vasilii Petrenko <b>Research Associate</b>	<b>Sep. 2013 – Sep. 2014</b>
Partnership Education Program (PEP) at Woods Hole Oceanographic Institution, Woods Hole, MA With Ambrose Jearld (NOAA), George Liles (NOAA), Amanda Spivak (WHOI), Ben Gutierrez (USGS) <b>Summer Intern</b>	<b>May 2013 – Aug. 2013</b>
Center for Translational Neuromedicine, University of Rochester, Rochester, NY With Zhuoxun Chen, Robert Agate, Steven A. Goldman <b>Research Associate</b>	<b>Sep. 2011 – Mar. 2013</b>

## **FIELD CAMPAIGNS AND MISSIONS**

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<i>NASA Dragonfly Mission to Titan</i> Mission Team Observer	<b>Nov. 2020</b>
<i>Fe behavior and bioavailability in sub-aerial runoff into the Ross Sea Taylor Valley and Miers Valley, McMurdo Dry Valleys, Antarctica</i> Co-led with Chris Gardner, The Ohio State University	<b>Dec. 2019 – Jan. 2020</b>

<i>The Role Of Glacial History On The Structure And Functioning Of Ecological Communities In The Shackleton Glacier Region Of The Transantarctic Mountains</i> Shackleton Glacier, Transantarctic Mountains, Antarctica Led by Byron Adams, Brigham Young University	<b>Dec. 2017 – Jan. 2018</b>
<i>McMurdo Long-tern Ecological Research Network (MCM-LTER)</i> Taylor Valley, McMurdo Dry Valleys, Antarctica Led by Mike Gooseff, University of Colorado Boulder	<b>Dec. 2016 – Feb. 2017</b>
<i>In-situ cosmogenic production of <sup>14</sup>C in firn and ice</i> Summit Station, Greenland Led by Vasilii Petrenko, University of Rochester	<b>May. 2014 – Jul. 2014</b>

## **AWARDS AND FUNDING**

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<b>Woods Hole Oceanographic Institution Postdoctoral Scholar (\$100,300)</b>	<b>Dec. 2019</b>
National SACNAS Chapter Award – Outstanding Prof. Development (President)	<b>Oct. 2019</b>
NSF OPP #1341631 – Supplement – awarded to W.B. Lyons (M.A. Diaz, Ghost) (\$12,452) <i>The Role of Glacial History on the Structure and Functioning of Ecological Communities in the Shackleton Glacier Region of the Transantarctic Mountains</i>	<b>Jun. 2019</b>
Ray Travel Award (\$1,000)	<b>May 2019</b>
Women of Color Advancement Grant (\$1,000)	<b>May 2019</b>
Center for Energy Research, Training, and Innovation (CERTAIN) SACNAS Travel (\$5,000)	<b>May 2019</b>
Geological Society of America Student Research Grant (\$660)	<b>Apr. 2019</b>
International Association of Geochemistry Student Grant (\$1,618)	<b>Apr. 2019</b>
NSF OPP #1341631 – Supplement – awarded to W.B. Lyons (M.A. Diaz, Ghost) (\$5,020) <i>The Role of Glacial History on the Structure and Functioning of Ecological Communities in the Shackleton Glacier Region of the Transantarctic Mountains</i>	<b>Aug. 2020</b>
Geochemical Society Travel Award (\$1,500)	<b>Aug. 2018</b>
Purdue SEED Proposal (\$8,175)	<b>Dec. 2017</b>
<b>National Science Foundation Graduate Research Fellowship (\$132,000)</b>	<b>Mar. 2017</b>
Recruitment and Diversity Services Travel Award (\$1,500)	<b>Mar. 2017</b>
Friends of Orton Hall Travel Award (\$3,471)	<b>2016-2019 (4)</b>
Geological Society of America On to the Future Travel Award (\$650)	<b>July 2016</b>
Dean's List, University of Rochester	<b>May 2014</b>

## **PEER REVIEWED PUBLICATIONS AND PAPERS**

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- (14) **Diaz, M.A.**, Gardner, C.B., Elliot, D.H., Adams, B.J., Lyons, W.B. (In preparation). *Change at 85 Degrees South: Heekin and Thanksgiving Valley Proglacial Lakes from 1960 to 2020*. Anticipated submission to Antarctic Science.
- (13) **Diaz, M.A.**, Fortner, S.K., Lyons, W.B. (In revision). *High resolution concentration-discharge relationships in managed watersheds: a 30+ year analysis*. Applied Geochemistry.

- (12) Lemoine, N.P., Adams, B.J., **Diaz, M.A.**, Dragone, N.B., Franco, A.L.C., Fierer, N., Lyons, W.B., Hogg, I.D., Wall, D.H. (Submitted). *Antarctic microbial community assembly reveals strong dispersal limitation*. Proceedings of the National Academy of Sciences.
- (11) Fortner, S.K., Vogt, L.K., Brown, A., **Diaz, M.A.** (Submitted). *An undergraduate course-based soil lead research and partnering model to address systemic racism and the enduring legacy of redlining (ENV-2021-0013)*. Environmental Justice.
- (10) Dragone, N.B., **Diaz, M.A.**, Hogg, I., Lyons, W.B., Jackson, W.A., Wall, D.H., Adams, B.J., Fierer, N. (In review). *Exploring the boundaries of microbial habitability in soil*. Journal of Geophysical Research: Biogeosciences.
- (9) Lyons, W.B., Carey, A.E., Gardner, C.B., Welch, S.A., Smith, D.F., Szyrkiewicz, A., **Diaz, M.A.**, Croot, P., Henry, T., Flynn, R. (In review). *The Geochemistry of Irish Rivers*. Journal of Hydrology: Regional Studies.
- (8) **Diaz, M.A.**, Bierman, P.R., Corbett, L.B., Adams, B.J., Hogg, I., Fierer, N., Wall, D.H., Lyons, W.B. (2020; In review). *Relative terrestrial exposure ages inferred from meteoric  $^{10}\text{Be}$  and  $\text{NO}_3^-$  concentrations in soils along the Shackleton Glacier, Antarctica*. Earth Surface Dynamics Discussion. <https://doi.org/10.5194/esurf-2020-50>.
- (7) **Diaz, M.A.**, Jackson, W.A., Adams, B.J., Wall, D.H., Hogg, I.D., Fierer, N., Welch, S.A., Gardner, C.B., Lyons, W.B. (2020; accepted). *Geochemical zones and environmental gradients for soils from the Central Transantarctic Mountains, Antarctica*. Biogeosciences Discussion. [doi.org/10.5194/bg-2020-316](https://doi.org/10.5194/bg-2020-316).
- (6) **Diaz, M.A.**, Li, J., Michalski, G., Adams, B.J., Wall, D.H., Hogg, I., Fierer, N., Welch, S.A., Gardner, C.B., Lyons, W.B. (2020). *Stable isotopes of nitrate, sulfate, and carbonate in soils from the Transantarctic Mountains, Antarctica: A record of atmospheric deposition and chemical weathering*. Frontiers in Earth Science special issue: Novel Isotope Systems and Biogeochemical Cycling During Cryospheric Weathering in Polar Environments 8(341). <https://doi.org/10.3389/feart.2020.00341>.
- (5) **Diaz, M.A.**, Welch, S.A., Sheets, J., Welch, K.A., Adams, B.J., Khan, A.L., McKnight, D.M., Cary, S.C., Lyons, W.B. (2020). *Geochemistry of Aeolian Material from the McMurdo Dry Valleys, Antarctica: Insights into Dust Sources*. Earth and Planetary Science Letters 547: 116460. [doi.org/10.1016/j.epsl.2020.116460](https://doi.org/10.1016/j.epsl.2020.116460).
- (4) Lyons, W.B., Foley, K.K., Carey, A.E. **Diaz, M.A.**, Bowen, G.J., Cerling, T. (2020). *The Isotopic Geochemistry of  $\text{CaCO}_3$  Encrustations in Taylor Valley, Antarctica: Implications for their Origin*. Acta Geographica Slovenica 60(2): 105-119. <https://doi.org/10.3986/AGS.7233>.
- (3) **Diaz, M.A.**, Lyons, W.B., Adams, B.J., Welch, S.A., Khan, A.L., McKnight, D.M., Cary, S.C. (2018). *Major Oxide Chemistry of Mineral Dust, McMurdo Dry Valleys, Antarctica: Revisited*. Proscience 5: 25-30. DOI:10.14644/dust.2018.005.

- (2) **Diaz, M.A.**, Adams, B.J., Welch, K.A., Welch, S.A., Opiyo, S., Khan, A.L., McKnight, D.M., Cary, S.C., Lyons, W.B. (2018). *Aeolian Material Transport and its Role in Landscape Connectivity in the McMurdo Dry Valleys, Antarctica*. *Journal of Geophysical Research: Earth Surface*. DOI: 10.1029/2017JF004589.
- (1) **Diaz, M.A.**, Yu, H., Deuerling, K.M., Wörner, G., Gardner, C.B., Harmon, R.S., Goldsmith, S.T., Carey, A.E., Lyons, W.B. (2017). *The Flux of Saharan Dust to Panama and its Influence on Soil Geochemistry*. *Proscience* 3: 38-43. DOI:10.14644/dust.2016.006.

### **TALKS (\*DENOTES INVITED)**

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- (15) **Diaz, M.A.\*** (2021). *Geochemistry of soils from the Shackleton Glacier region, Antarctica and implications for biogeography*. Colorado State University School of Global Environmental Sustainability Antarctic Lecture Series.
- (14) **Diaz, M.A.\*** (2021). *The Shackleton Glacier region as a model for "suitable environments"*. Scripps Institute of Oceanography Polar Center "Polar Hour".
- (13) **Diaz, M.A.\***, Gardner, C.B., Elliot, D.H., Adams, B.J., Lyons, W.B. (2020). *Change at 85 Degrees South: Shackleton Glacier Region Proglacial Lakes from 1960 to 2020*. International Glaciological Society Early Career Seminar.
- (12) **Diaz, M.A.**, Gardner, C.B., Elliot, D.H., Adams, B.J., Lyons, W.B. (2020). *Change at 85 Degrees South: Shackleton Glacier Region Proglacial Lakes from 1960 to 2020*. GSA Annual Meeting 2020: Measuring and Modeling the Water Cycle in Cold Regions.
- (11) **Diaz, M.A.**, Bierman, P.R., Corbett, L.B., Adams, B.J., Hogg, I., Fierer, N., Wall, D.H., Lyons, W.B. (2020) *Relative exposure ages inferred from  $^{10}\text{Be}$  and  $\text{NO}_3$  concentrations along the Shackleton Glacier, East Antarctica*. SCAR COMNAP Open Science Meeting 2020 (canceled due to COVID-19).
- (10) **Diaz, M.A.\***, Lyons, W.B. (2019). *Application of inverse distance weighted (IDW) interpolation for Antarctic geochemical studies*. The Ohio State University GIS Day 2019.
- (9) **Diaz, M.A.**, Gardner, C.B., Elliot, D.H., Adams, B.J., Lyons, W.B. (2019). *Change at 85 Degrees South: Heekin Valley Proglacial Lakes from 1960 to 2018*. SACNAS National Diversity in STEM Conference 2019: Multidisciplinary Assessment of Climate Change in Arctic and Antarctic Regions.
- (8) **Diaz, M.A.\***, Adams, B.J., Hogg, I., Fierer, N., Wall, D.H., Gardner, C.B., Shaver-Adams, M., Lyons, W.B. (2019). *The hunt for "suitable" habitats along the Shackleton Glacier, Antarctica: a geochemical approach*. University of Texas El Paso Geological Sciences Seminar.
- (7) **Diaz, M.A.**, Adams, B.J., Hogg, I., Fierer, N., Wall, D.H., Gardner, C.B., Shaver-Adams, M., Lyons, W.B. (2019). *Surface Geochemistry of the Shackleton Glacier Region, Antarctica and Implications for Soil Habitability*. Goldschmidt 2019 Conference: Biogeochemical cycling in changing glacial habitats and downstream ecosystems.

- (6) Adams, B.J., Lyons, W.B., Hogg, I., Fierer, N., Wall, D.H., Gardner, C.B., **Diaz, M.A.**, Shaver-Adams, M. (2018). *The role of glacial history on the structure and functioning of ecological communities in the Shackleton Glacier region of the Transantarctic Mountains*. AGU Fall 2018 Meeting: Preliminary Discoveries from the 2015–2018 Shackleton Glacier Deep Field Camp, Antarctica.
- (5) **Diaz, M.A.**, Adams, B.J., Hogg, I., Fierer, N., Wall, D.H., Gardner, C.B., Shaver-Adams, M., Lyons, W.B. (2018). *Distribution of water-soluble salts along the Shackleton Glacier, Antarctica and implications for soil habitability*. GSA Annual Meeting 2018: Climate Variability, Change, and Water Resources.
- (4) **Diaz, M.A.**, Lyons, W.B., Adams, B.J., Welch, S.A., Khan, A.L., McKnight, D.M., Cary, S.C. (2018). *Geochemistry of Mineral Dust, McMurdo Dry Valleys, Antarctica: Revisited*. DUST 2018 - International Conference on Atmospheric Dust.
- (3) **Diaz, M.A.**, Adams, B.J., Khan, A.L., Welch, K.A., Welch, S.A., McKnight, D.M., Cary, S.C., Lyons, W.B. (2017). *Soluble and bulk geochemical analysis of aeolian material from the McMurdo Dry Valleys, Antarctica*. GSA Annual Meeting 2017: The Aeolian Realm.
- (2) **Diaz, M.A.**, Adams, B.J., Khan, A.L., Welch, K.A., Welch, S.A., McKnight, D.M., Cary, S.C., Lyons, W.B. (2017). *Geochemical Characterization of Wind-Blown Dust from the McMurdo Dry Valleys of Antarctica*. SACNAS National Diversity in STEM Conference 2017: Life Sciences: Ecology/Evolutionary Biology, Other Life Sciences & Earth Science.
- (1) **Diaz, M.A.**, Yu, H., Deuerling, K.M., Wörner, G., Gardner, C.B., Harmon, R.S., Goldsmith, S.T., Carey, A.E., Lyons, W.B. (2016). *The Flux of Saharan Dust to Panama and its Influence on Soil Geochemistry*. DUST 2016 - International Conference on Atmospheric Dust.

## POSTERS (\*\*DENOTES MENTEE)

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- (9) Piergallini, B.\*\*, Goldsmith, S.T., **Diaz, M.A.**, Welch, K.A., Lyons, W.B. (2020). *Concentrations and deposition rates of acid soluble metals in Taylor Valley stream deltas – the sediment dynamics in rapidly changing fluvial systems*. SCAR COMNAP Open Science Meeting 2020. (cancelled due to COVID-19).
- (8) Lyons, W.B., Szyrkiewicz, A., Welch, S.A., Smith, D.F., **Diaz, M.A.**, Croot, P., Henry, T., Carey, A.E. (2020). *The Geochemistry and Potential Sources of Sulphur in Irish Rivers*. Irish Geological Research Meeting 2020.
- (7) **Diaz, M.A.**, Gardner, C.B., Elliot, D.H., Adams, B.J., Lyons, W.B. (2019). *Change at 85 Degrees South: Heekin Valley Proglacial Lakes from 1960 to 2018*. SCAR ISAES 2019.
- (6) **Diaz, M.A.**, Gardner, C.B., Elliot, D.H., Adams, B.J., Lyons, W.B. (2019). *Climate Change at 85 Degrees South: Heekin Lakes from 1996 to 2018*. Byrd Center 1<sup>st</sup> Annual Climate Symposium.
- (5) Lyons, W.B., Carey, A.E., Welch, S.A., Gardner, C.B., **Diaz, M.A.**, Fortner, S.K., Gilbert, D.\*\*, Monagle, C.\*\*, Calero, A.E. (2019). *The geochemistry of soils from around the world, an Earth Science perspective*. Soil Science Research Day.

- (4) **Diaz, M.A.**, Welch, S.A., Sheets, J., Welch, K.A., Adams, B.J., Khan, A.L., McKnight, D.M., Cary, S.C., Lyons, W.B. (2018). *Sediment Geochemistry of Aeolian Material from the McMurdo Dry Valleys, Antarctica: Insights into Dust Sources*. Goldschmidt2018 poster session.
- (3) **Diaz, M.A.**, Fortner, S.K., Lyons, W.B. (2016). *Land management impacts on hydrology and concentration vs. discharge relationships in small, central Ohio watersheds*. GSA Annual Meeting 2016 poster session.
- (2) **Diaz, M.A.**, Welch, S.A., Welch, K.A., Khan, A.L., Adams, B., Cary, C., McKnight, D.M., Lyons, W.B. (2016). *Preliminary characterization of wind-blown dust from the McMurdo Dry Valleys of Antarctica*. GSA Annual Meeting 2016 poster session.
- (1) **Diaz, M.A.**, Lyons, W.B. (2016). *The Influence of Agricultural Management Practices and Cover Cropping on Water Quality*. SACNAS National Diversity in STEM Conference 2016 graduate poster session.

## **LEADERSHIP AND PROFESSIONAL SERVICE**

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- Executive Committee graduate student representative for the Byrd Polar and Climate Research Center (2019- 2020)
- Diversity Committee graduate student representative for the School of Earth Sciences (OSU) (2017-2020)
- **President (2018), Vice President (2017), Outreach Coordinator (2019) – Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) OSU Chapter (2016-2020)**  
 Primary leader: Through both university and community partnerships, acquired funding for two external speakers (Dr. Knatokie Ford and Catalina Martinez), created “FAC Talks” featuring faculty members from diverse departments each month, and funded six students/faculty (through OSU and NSF) to attend the National Diversity in STEM Conference in 2019.
- Planning committee for symposium celebrating the “50<sup>th</sup> Anniversary of the First All-Women Research Team in Antarctica” (2018-2019)  
 Speaker for session: “Science for all and all for science”
- Treasurer- School of Earth Sciences Graduate Student Club (2017-2019)

## **OUTREACH**

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- Science fair judge for Mashpee Middle High School (01/2021)
- WHOI recruitment booth for SACNAS (12/2020)
- Woods Hole Partnership Education Program (PEP) summer “mini mentor” (06/2020)  
 Advised two students from University of Texas El Paso
- “Role Model” for OSU Latinx Role Models Day (03/2020 – suspended due to COVID-19)
- Group leader for Optimizing the Intern Experience: A Woods Hole Workshop (06/2019)
- Woods Hole Partnership Education Program (PEP) alumni talk and panel (06/2017, 06/2018)
- NSF GRFP panel for OSU REU summer interns (06/2018, 06/2019)
- Science Olympiad Dynamic Planet grader (04/2019)

- OSU Graduate/Professional Student Recruitment Initiative panel (10/2018)
- Group coordinator for OSU Latinx Role Models Day (04/2018)
- Interpreters for the Medical Profession through Advanced Curriculum and Teaching (IMPACT) role model (03/2018)
- Louis Stokes Alliances for Minority Participation (LSAMP) Graduate panel (02/2017, 04/2017, 08/2017)
- OSU Latinx Early Arrival Program panel (08/2017)

## **SCIENCE COMMUNICATION**

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- Metal Redlining Network Columbus, OH facilitator (06/2019- ongoing)  
[https://serc.carleton.edu/earthconnections/networks/metal\\_redlining/index.html](https://serc.carleton.edu/earthconnections/networks/metal_redlining/index.html)
- Polar Science Literacy workshop at Rutgers University (05-06/2020)
- Ohio Camp Ot'Okwa soil organism activity (06/2020)  
<https://youtu.be/YO1THQo3hko>
- PBS NOVA Virtual Field Trip (04/2020)  
<https://www.youtube.com/watch?v=Qewqxm8xPvo>
- Created monthly “Fun Fridays” interactive science event for K-12 students at Columbus Northside Metropolitan Library (11/2019-ongoing)
- Channel 10 local news Antarctic research spotlight (11/2019)
- West Fest booth volunteer (05/2017, 05/2018, 06/2019)
- The Ohio State University College of Arts and Sciences Student Spotlight (01/2018)  
<https://artsandsciences.osu.edu/news/earth-sciences-antarctica>
- *Byrd 1933* film panelist (01/2018)
- Environmental Film Series panelist (11/2017)
- Franklinton Friday STEAM Factory “Spooky Talk” (10/2017)
- Byrd Polar and Climate Research Center Student Interview (09/2017)  
<https://vimeo.com/228320380>
- COSI After Dark interactive booth volunteer (08/2017)
- Workshop on Science Communication- Polar-ICE Sci-I teacher workshop (06/2017)
- Ohio History Connection polar booth with BPCRC (04/2017)

## **MEMBERSHIPS**

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Geochemical Society

Geological Society of America (GSA)

International Association of Geochemistry (IAGC)

Society for Advancing Chicanos/Hispanics and Native Americans in Science (SACNAS)

Society of Latinxs/Hispanics in Earth and Space Science (SOLESS)

Earth Science Women's Network

## **LANGUAGES**

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English- native language

Spanish- read, speak, and write with moderate proficiency

Japanese and French- read, speak and write with basic competence