

## Cansu Demir

Ph.D. Candidate and Graduate Research Assistant  
Earth and Planetary Sciences  
University of Texas at Austin

+1 512 915 8840  
[cdemir@utexas.edu](mailto:cdemir@utexas.edu)  
<https://cannsudemir.github.io>

## EDUCATION

---

**Ph.D. in Geological Sciences**  
The University of Texas at Austin

Aug 2018 - Aug 2024  
Austin, TX, USA

Spatio-temporal dynamics of groundwater flow and transport along the Arctic coasts:  
Exploring subterranean estuaries, fluxes and seasonal system drivers  
Advisor: M. Bayani Cardenas

**TOOLS:** Phys. hydrogeology and geophysical field techniques, laboratory analyses (water isotopes-major ions), time series analyses via 1D-CNN/LSTM/Random Forest (on data acquired in the field & reanalysis products MERRA-2, GLDAS), and multi-physics numerical modeling of groundwater flow, salt-heat transport (via COMSOL)

-----

**M.Sc. in Environmental Engineering**

Middle East Technical University

Sept 2015 - Jul 2018  
Ankara, Turkey

Topic: Rehabilitation assessment of a depleted coastal aquifer

Advisor: Kahraman Unlu

**TOOLS:** Field observations, parameter estimation (PEST) and groundwater flow and artificial recharge modeling via MODFLOW (GMS & ArcGIS)

**Side Project:** Indust. Specif. Guidebooks on Wastes: Thermal Power & Waste Accumulator Recyc. Plants  
Collab.: Republic of Turkey, The Ministry of Environment and Urbanization

**TOOLS:** Site visits, interviews with business owners/managers and analysis of the waste generation data provided

-----

**B.Sc. in Environmental Engineering**

Middle East Technical University

Sept 2010 - Jun 2015  
Ankara, Turkey

## PROFESSIONAL EXPERIENCE

---

**Research/Teaching Assistant**  
The University of Texas at Austin

2018 - today  
Austin, TX

**Research/Teaching Assistant**  
Middle East Technical University

2015 - 2018  
Ankara, Turkey

## In-Prep

- 1 **Demir, C.**, Guimond, J., McClelland, J. W., Charette, M. A., Cardenas, M.B. Groundwater-surface water interactions at a coastal Arctic lagoon: Insights from seasonal hydraulic and thermal observations. In prep. (target journal: WRR)
- 2 **Demir, C.**, Guimond, J., McClelland, J. W., Charette, M. A., Cardenas, M.B. Terrestrial, oceanic and climatic factors governing seasonal coastal groundwater hydrology revealed by explainable machine learning techniques. In prep. (target journal: GRL)
- 3 Bristol, E.M., Behnke, M.I., Spencer, R.G.M., **Demir, C.**, Cardenas, M.B., Charette, M.A. and McClelland, J.W. Composition and biodegradability of dissolved organic matter in supra-permafrost groundwater and surface waters across seasons. In prep. In prep. (target journal: L&O)

## Under-review

- 1 **Demir, C.**, McClelland, J. W., Bristol, E., Charette, M. A., M., Cardenas, M.B. Coastal supra-permafrost aquifers of the Arctic and their significant groundwater, carbon and nitrogen fluxes. GRL, in review.

## Published

- 1 Wilson, S. J., Moody, A., McKenzie, T., Cardenas, M. B., Luijendijk, E., Sawyer, A. H., Wilson, A., Michael, H., Xu, B., Knee, K. L., Cho, H., Weinstein, Y., Paytan, A., Moosdorf, N., Chen-Tung, C., Beck, M., Lopez, C., Murgulet, D., Kim, G., Charette, M., Waska, H., Ibáñez, S. P., Chaillou, G., Oehler, T., Onodera, S. I., Saito, M., Rodellas, V., Dimova, N., Montiel, D., Dulai, H., Du, J., Petermann, E., Chen, X., Davis, K., Lamontagne, S., Sugimoto, R., Wang, G., Li, H., Torres, A., **Demir, C.**, Bristol, E., Connolly, C. T., McClelland, J. W., Silva B. J., Tait, D., Kumar, B., Viswanadham, R., Sarma, V., Silva-Filho, E., Shiller, A., Lecher, A., Tamborski, J., Bokuniewicz, H., Rocha, C., Reckhardt, A., Böttcher, Jiang, S., Stieglitz, T., Gbewezoun, H.G.V., Charbonnier, C., Anschutz, P., Terrones, L. M. H., Babu, S., Szymczycha, B., Sadat-Noori, M., Niencheski, F., Null, K., Tobias, C., Song, B., Anderson, I. C., Santos, I. Global subterranean estuaries modify groundwater nutrient loading to the ocean. *Limnology and Oceanography Letters*. Accepted in March 23, 2024. In production.
- 2 Guimond, J., **Demir, C.**, Kurylyk, B. L., Walvoord, M. A., McClelland, J. W., Cardenas, M. B. Wind-modulated groundwater discharge along a microtidal Arctic coastline. *Environmental Research Letters* 18, 094042 (2023). doi:10.1088/1748-9326/acf0d8
- 3 **Demir, C.**, Fanta, D., Akıntuğ, B., Ünlü, K. Modeling coastal Güzelyurt (Morphou) aquifer in northern Cyprus for mitigation of groundwater depletion through managed aquifer recharge. *Sustain. Water Resources Management* 8, 96 (2022). doi:10.1007/s40899-022-00683-4
- 4 Pedrazas, M.N., Cardenas, M.B., Hosain, A., **Demir, C.**, Ahmed, K. M., Akhter, S. H., Wang, L., Datta, S., Knappe, P. S. K. Application of electrical resistivity to map the stratigraphy and salinity of fluvio-deltaic aquifers: case studies from Bangladesh that reveal benefits and pitfalls. *Hydrogeology Journal* 29, 1601–1610 (2021). doi:10.1007/s10040-021-02342-y
- 5 Pedrazas, M. N., Cardenas, M. B., **Demir, C.**, Watson, J. A., Connolly, C. T., McClelland, J. W. Absence of ice-bonded permafrost beneath an Arctic lagoon revealed by electrical geophysics. *Science Advances* 6, 43 (2020). eabb5083. doi:10.1126/sciadv.abb5083
- 6 **Demir, C.**, Yetiş, Ü., Ünlü, K. Identification of waste management strategies and waste generation factors for thermal power plant sector wastes in Turkey. *Waste Management and Research* 37, 3, 210-218 (2019). doi:10.1177/0734242X18806995

## AWARDS RECEIVED

---

Graduate School Summer 2024 Fellowship   The University of Texas at Austin	2024
OSM registration & travel award   The Permafrost Coastal Systems Network (PerCS-Net)	2024
Richard Chuchla Dean's Discretionary Fellowship   Jackson School of Geosciences	2021
Fulbright Scholarship   Turkish and U.S. Government	2018-2020
AGU abstract-registration award   The Permafrost Coastal Systems Network (PerCS-Net)	2020
Computational Res. Tech. fellowship   TACC Summer Institute on Applied Parallel Programming	2020
Geological Society of America (GSA) Research Grant	2019
Marion W. DeFord Off-Campus Research Fellowship   Jackson School of Geosciences	2019

## PRESENTATIONS

---

- 1 **Demir, C.**, McClelland, J. W., Bristol, E., Charette, M. A., Cardenas, M. B. Exploring Arctic Coastal Aquifers: Terrestrial Groundwater, Carbon and Nitrogen Fluxes. Ocean Sciences Meeting, Feb 19, 2024 (Oral). ID: [HE11A-03](#)
- 2 Guimond, J. A., **Demir, C.**, McClelland, J. W., Cardenas, M. B. Geophysical insights into coastal permafrost and salinity distributions below variably degraded Arctic tundra. Ocean Sciences Meeting, Feb 19, 2024 (Poster). ID: [HE14A-2571](#)
- 1 **Demir, C.**, Guimond, J. A., Bristol, E., Bullock, E., Charette, M. A., McClelland, J. W., Cardenas, M. B. Seasonal Progression of Coastal Supra-permafrost Aquifers and Forces Driving Groundwater Flow. American Geophysical Union, Fall Meeting 2023 (Oral). ID: [C14B-04](#)
- 2 Guimond, J. A., **Demir, C.**, Cardenas, M. B., McClelland, J. W., Walvoord, M. A., Kurylyk, B. L. Groundwater Salinity Dynamics and Drivers Along an Actively Degrading Arctic Coastline. American Geophysical Union, Fall Meeting 2023 (Oral). ID: [H13E-01](#)
- 3 Bullock, E. J., Schaal, I., **Demir, C.**, Cardenas, M. B., McClelland, J. W., Charette, M. A., Mason, R., Huffman, W. and Inman, H. Groundwater Inputs of Mercury to Arctic Coastal Lagoons. International Symposium on Arctic Research (ISAR-7), March 2023.
- 4 Bullock, E. J., Schaal, I., **Demir, C.**, Cardenas, M. B., McClelland, J. W., Charette, M. A., Mason, R., Huffman, W. and Inman, H. Mercury dynamics and associations in Arctic coastal groundwater. ACS, August 2023.
- 5 **Demir, C.**, Guimond, J., Bristol, E., Bullock, E., Schaal, I., Henderson, P., Charette, M. A., McClelland, J. W., Cardenas, M. B. Seasonal Dynamics of Groundwater Flow and Transport in the Nearshore Arctic. American Geophysical Union, Fall Meeting 2022 (Poster).ID: [C42C-1037](#)
- 6 Guimond, J., **Demir, C.**, Cardenas, M. B., McClelland, J. W., Walvoord, M. A., Kurylyk, B. Groundwater Salinity Dynamics and Drivers Along an Actively Degrading Arctic Coastline. American Geophysical Union, Fall Meeting 2022 (Oral).ID: [C35A-08](#)
- 7 Bristol, E. M., **Demir, C.**, Schaal, I., Cardenas, M. B., Charette, M. A., McClelland, J. W. Dissolved Organic Matter in an Arctic Subterranean Estuary. American Geophysical Union, Fall Meeting 2022 (Poster).ID: [C42C-1031](#)
- 8 Bristol, E.M., Sanders, A., **Demir, C.**, Cardenas, M.B., Charette, M.A., McClelland, J.W. Dissolved Organic Matter and Nutrients Across an Arctic Subterranean Estuary. LTER All Scientists Meeting 2022.
- 9 Bullock, E. J., Schaal, I., **Demir, C.**, Cardenas, M. B., McClelland, J. W., Charette, M. A., Mason, R., Huffman, W. and Inman, H. Groundwater input of mercury to Arctic coastal lagoons, Ocean Sciences Meeting 2022.
- 10 Schaal, I., Bullock, E., **Demir, C.**, Cardenas, M. B., McClelland, J. W., Charette, M. A. Distribution and Dynamics of Trace Metals from Groundwater Discharging into an Arctic Coastal Lagoon. Ocean Sciences Meeting 2022.
- 11 **Demir, C.**, Cardenas, M. B., McKinney, S., Nguyen, W., Bristol, E., Bullock, E., Sanders, A., Schaal, I., Charette, M., McClelland, J. Groundwater Flow and Transport in a Coastal Aquifer in the Arctic. American Geophysical Union, Fall Meeting 2021 (Oral). ID: [C44A-0](#)
- 12 Nguyen, W., Cardenas, M. B., Datta, S., Kwak, K., Varner, T., **Demir, C.**, Pedrazas, M., Knappett, P. Groundwater-surface water interactions in seasonally and tidally flooded riverbanks: numerical modeling of the Meghna River, Bangladesh. American Geophysical Union, Fall Meeting 2021 (eLightning). ID: [H35A-01](#)
- 13 **Demir, C.**, Cardenas, M. B., Pedrazas, M. N., McClelland, J. W., Charette, M. A. Nearshore Submarine Groundwater Discharge to an Arctic Lagoon. American Geophysical Union, Fall Meeting 2020 (eLightning). ID: [B120-04](#)
- 14 **Demir, C.**, Cardenas, M. B., McClelland, J. W., Pedrazas, M. N. Groundwater Discharge in the Lagoons of Alaskan Beaufort Sea. American Geophysical Union, Fall Meeting 2019 (Poster). ID: [C13E-1362D](#)

- 15 Rechner A. F., He, C., Cabraal, S. A., Baiocchi, J., **Demir, C.**, Denham, A., Edgington, A., Ferrari, B., Fisher, C., Goldfarb, E. J., Jones, B., Manlove, H., McCormick, E. L., Pedrazas, M. A., Restrepo Acevedo, A. M., Roumelis, C., Smith-Salgado, C., Trcka, J., Beal, L. K., Southard, P., Ferencz, S. B., Li, L., Perkins, G., Roback, R. C., O'Connor, M., Matheny, A. M. Groundwater and surface water interactions in the Valles Caldera Watershed, New Mexico: an evaluation of water chemistry sensitivity to precipitation variability. American Geophysical Union, Fall Meeting 2019 (Poster). ID: H13N-1916
- 16 **Demir, C.**, Yetiş, Ü., Ünlü, K. Identification of Waste Management Strategies and Waste Generation Factors for Thermal Power Plant Sector Wastes in Turkey. Eurasia Waste Management Symposium 2018 (Oral). Istanbul, Turkey.
- 17 **Demir, C.**, Fanta, D., Akintug, B., Unlu, K. Conceptual and Numerical Modeling of Guzelyurt Aquifer, Turkish Republic of Northern Cyprus (TRNC). International Symposium on GIS Applications in Geography & Geosciences 2017 (Oral). Canakkale, Turkey.

## INVITED SEMINARS

---

Applied Ocean Physics and Engineering | Woods Hole Oceanographic Institution Nov 2023

## TEACHING EXPERIENCE

---

Teaching Assistant   Introduction to Physical and Chemical Hydrogeology (TA rating: 4.5/5)	SP 2021, 23
Teaching Assistant   Groundwater Hydrology (TA rating: 5/5)	SP 2021
Teaching Assistant   Transport Processes in Environmental Engineering	SP 2016, 17, 18
Teaching Assistant   Environmental Microbiology Laboratory	SP 2016, 17, 18
Teaching Assistant   Environmental Management	Fall 2017
Teaching Assistant   Environmental Modeling Laboratory	Fall 2017
Teaching Assistant   Unit Operations and Processes of Water Treatment	Fall 2016

## ACADEMIC SERVICE and MENTORSHIP

---

**Peer-review** - Journal of Hydrology 2024

**Co-organizer and Host** - Arctic Coastal Observations, Research, and Networking (**ACORN**) seminar series  
The Permafrost Coastal Systems Network Fall 2022 - present

**Graduate student mentor** - Peer Mentor Support Program  
Jackson School of Geosciences Fall 2022

**Life and career mentor for new graduates** - Mentoring Programs for METU Students and Graduates  
Middle East Technical University 2022 - 2023

**Co-organizer and Host** - Water, Climate and Environment Departmental Seminar Series  
Jackson School of Geosciences Fall 2021 - Spring 2022

## WORKSHOPS

---

**Permafrost Coastal Systems Network Retreat** Feb 14-17, 2024  
Organized by PerCS-Net funded by NSF-AccelNet program New Orleans, LA

**Arctic Coasts Workshop** Oct 9-11, 2023  
Topic: Changes, Impacts and Solutions - Working Towards a Resilient Future

Last updated: 04/07/24

Organized by PerCS-Net funded by NSF-AccelNet program

University of Colorado Boulder

**Belonging, accessibility, justice, equity, diversity, and inclusion (BAJEDI) Workshop** Oct 3, 2023  
Led by Polar Science Early Career Community Office (PSECCO) Online

**International Arctic Coastal Network retreat** Oct 16-21, 2022  
Organized by PerCS-Net funded by NSF-AccelNet program Mystic, CT

**TACC Summer Institute Series on Applied Parallel Programming** July 2, 9, 16, 23, 2020  
By Texas Advanced Computing Center Online

## PROFESSIONAL ASSOCIATIONS

---

Member   American Geophysical Union (AGU)	2019 - present
Member   Association of Polar Early Career Scientists (APECS)	2021 - present
Member   Permafrost Coastal Systems Network (PerCS-Net)	2019 - present
Member   The Arctic Research Consortium of the United States (ARCUS)	2019 - present
Member   Permafrost Young Researchers Network (PYNR)	2019 - present
Member   Geological Society of America (GSA)	2019 - 2020

## FIELD EXPERIENCE and TRAINING

---

**Aug 2021, June - Jul - Oct 2022, Jul 2023** Coastal hydrogeology field techniques  
Simpson Lagoon, Prudhoe Bay, AK, USA

**May 2022** Small boat and cold weather survival training  
Port Aransas, TX

**Nov 2020-2021** Lake mixing dynamics  
Lake Travis, Austin, TX

**Jan 2020** River-bank hydrogeology field techniques  
Meghna River, Dhaka, Bangladesh

**Aug 2019** Coastal hydrogeology field techniques  
Kaktovik Lagoon, Barter Island, AK

**May 2019** General hydrogeology field techniques  
Valles Caldera, NM and Austin, TX

## COMPUTER SKILLS

---

Microsoft Office	Aquifer Hydraulic Prop: Aqtesolv
COMSOL	Python
ArcGIS	L <sup>A</sup> T <sub>E</sub> X
GMS (MODFLOW/PEST)	R
MATLAB	Git
Bash	Statistical time series tools: TFN
ML tools: 1D-CNN, Random Forest & LSTM	Adobe Illustrator
WebSite desing: HTML & CSS	ERI Inversion software: AGI EarthImager& Res2dinv

## FIELD and LABORATORY SKILLS

---

- Installment of piezometers for groundwater monitoring
- Operating with pressure transducers (CTDs by Solinst & InSitu)
  - Temperature sensors (Hobo/TrodX)
  - pCO<sub>2</sub> sensors (Pro-Oceanus)
  - Multi-parameter sensors (YSI)
- Topographical surveys with robotic total stations (Trimble)
- Electrical Resistivity Surveys (SuperSting R8)
- Ex-situ estimation of hydraulic conductivity (KSat, Hyprop)
- In-situ estimation of hydraulic conductivity (Slug tests)
- Protocols of water sample preparation for analysis in IC, ICP-MS, and isotope ratio mass spectrometer