

# Cansu Demir

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The University of Texas at Austin  
Jackson School of Geosciences  
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## EDUCATION

### Ph.D. in Geological Sciences

The University of Texas at Austin

Topic: Groundwater-surface water dynamics in the coastal Arctic

Advisor: M. Bayani Cardenas

Aug 2018 - May 2024

Austin, TX, USA

**TOOLS:** Phys. hydrogeology and geophysical field techniques, laboratory analyses (water isotopes-major ions), time series analyses via TFN & Random Forest/LSTM (on data acquired in the field & NASA GES DISC's Giovanni database), and multi-physics numerical modeling of groundwater flow, salt-heat transport (via COMSOL)

### M.Sc. in Environmental Engineering

Middle East Technical University

Topic: Rehabilitation assessment of a depleted coastal aquifer

Advisor: Kahraman Unlu

Sept 2015 - Jul 2018

Ankara, Turkey

**TOOLS:** Field observations, parameter estimation (PEST) and Water Budget 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

## JOURNAL ARTICLES

**ORCID ID:** 0000-0002-1325-1461

[Google Scholar Profile](#)

In-Prep

- 1 **Demir, C.**, Guimond, J., McClelland, J. W., Charette, M. A., Cardenas, M.B. Seasonal dynamics of groundwater flow and transport in the coastal Arctic.
- 2 **Demir, C.**, McClelland, J. W., Charette, M. A., Cardenas, M.B. Sources of Arctic nearshore groundwater and the origin of salinity.

## Submitted

- 1 **Demir, C.**, McClelland, J. W., Bristol, E., Charette, M. A., M., Cardenas, M.B. Supra-permafrost aquifers of the Arctic coast and their groundwater, carbon and nitrogen fluxes. Submitted to PNAS on Sept 24, 2023.
- 2 Wilson, S. J., Moody, A., McKenzie, T., Luijendijk, E., Cardenas, M. B., 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., Sugimoto, R., Wang, G., Li, H., Torres, A., **Demir, C.**, Bristol, E., Connolly, C. T., McClelland, J. W., Januario, B., Lamontagne, S., Kumar, B., Viswanadham, R., Sarma, V., Silva-Filho, E., Shiller, A., Lecher, A., Tamborski, J., Bokuniewicz, H., Rocha, C., Reckhardt, A., Böttcher, M. E., Shan, J., Stieglitz, T., Charbonnier, C., Anschutz, P., Terrones, L. M. H., Babu, S., Szymczycha, B., Chen, X., Jinzhou, D., Sadat-Noori, M., Niencheski, F., Null, K., Song, B., Anderson, I. C., Santos, I. Global subterranean estuaries control groundwater nutrient loading to the ocean. Submitted to Limnology and Oceanography Letters on Sept 8, 2023.

## Published

- 1 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
- 2 **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
- 3 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
- 4 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
- 5 **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

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.**, 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
- 2 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

Last updated: 09/28/23

- 3 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](#)
- 4 **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](#)
- 5 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](#)
- 6 **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](#)
- 7 **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](#)
- 8 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](#)
- 9 **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.
- 10 **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.

## TEACHING EXPERIENCE

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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

## UNIVERSITY SERVICE and MENTORSHIP

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**Co-organizer and Host** - Arctic Coastal Observations, Research, and Networking ([ACORN](#)) seminar series  
The Permafrost Coastal Systems Network Fall 2021 - 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

Last updated: 10/10/23

## WORKSHOPS

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### Arctic Coasts Workshop

Changes, Impacts and Solutions - Working Towards a Resilient Future  
Location: University of Colorado Boulder

Oct 9-11, 2023  
Boulder, CO

### Belonging, accessibility, justice, equity, diversity, and inclusion (BAJEDI) Workshop

Led by Polar Science Early Career Community Office (PSECCO)

Oct 3, 2023  
Online

### International Arctic Coastal Network retreat

Led by the University of Alaska Fairbanks

Oct 16-21, 2022  
Mystic, CT

### TACC Summer Institute Series on Applied Parallel Programming

By Texas Advanced Computing Center

July 2, 9, 16, 23, 2020  
Online

## PROFESSIONAL ASSOCIATIONS

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

## FIELD EXPERIENCE and TRAINING

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### Aug 2021, June - Jul - Oct 2022, Jul 2023

Simpson Lagoon, Prudhoe Bay, AK, USA

Coastal hydrogeology field techniques

### May 2022

Port Aransas, TX

Small boat and cold weather survival training

### Nov 2020-2021

Lake Travis, Austin, TX

Lake mixing dynamics

### Jan 2020

Meghna River, Dhaka, Bangladesh

River-bank hydrogeology field techniques

### Aug 2019

Kaktovik Lagoon, Barter Island, AK

Coastal hydrogeology field techniques

### May 2019

Valles Caldera, NM and Austin, TX

General hydrogeology field techniques

## COMPUTER SKILLS

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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
Machine Learning time series tools: Random Forest & LSTM	Adobe Illustrator
WebSite desing: HTML & CSS	ERI Inversion software: AGI EarthImager& Res2dinv

## FIELD and LABORATORY SKILLS

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- 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)
- Preparation of water samples for analysis (dilution, standard preparation)