

# Meinhard Bayani Ramos Cardenas

Curriculum Vitae as of June 2021

J. Nalle Gregory Regents Professor in Geological Sciences  
Department of Geological Sciences, Jackson School of Geosciences, The University of Texas at Austin  
Phone: (512)471-6897, Email: cardenas@jsg.utexas.edu

## Biographical Information

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Birth: 1977 in Göttingen, Germany  
Nationality: Philippines; US permanent resident in 2009 and naturalized citizen since 2015  
Marital status: Married since 1999 with a son born in 2002 and a daughter in 2007

## Academic Background

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Ph.D. in Earth and Environmental Science (Hydrology), 2006, New Mexico Inst. of Mining and Technol.  
Adviser: John L. Wilson  
M.S. in Geology (Hydrogeology), 2002, University of Nebraska-Lincoln  
Adviser: Vitaly A. Zlotnik  
B.S. in Geology, 1999, University of the Philippines-Diliman

## Research Profile

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*Discipline:* Hydrology - surface and subsurface  
*Processes:* Flow and reactive transport, including non-isothermal, variable-density, and multiphase flows  
*Environments:* Terrestrial, aquatic, coastal, marine, semi-arid, tropical, arctic  
*Methods:* Laboratory experiments (analog experiments and chemical analyses), in situ field observations (conventional water sampling and hydraulic monitoring, geophysics, ground-based and airborne remote-sensing), hydroinformatics and data mining, mathematical modeling (computational, analytical, statistical)  
*Applications:* Water quality and quantity issues

## Professional Appointments

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2020-present, J. Nalle Gregory Regents Professor in Geological Sciences, The University of Texas at Austin  
2016-2020, Professor, The University of Texas at Austin  
2011-2016, Associate Professor, The University of Texas at Austin  
2006-2011, Assistant Professor, The University of Texas at Austin  
2002-2006, Research Assistant, New Mexico Bureau of Geology and Mineral Resources  
2004-2005, Teaching Assistant, New Mexico Inst. Of Mining and Technology  
1999-2002, Teaching and Laboratory Assistant, University of Nebraska-Lincoln

## Honors and Recognition

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2017: Faculty Science Performance Award (Top Full Prof.), Dept. of Geological Sciences, UT Austin  
2016: Faculty Science Performance Award (Top Assoc. Prof.), Dept. of Geological Sciences, UT Austin  
2015: Faculty Science Performance Award (Top Assoc. Prof.), Dept. of Geological Sciences, UT Austin  
2013: Faculty Science Performance Award (Top Asst. Prof.), Dept. of Geological Sciences, UT Austin  
2012: Fred Holmsley Moore Distinguished Lecturer, University of Virginia  
Kohout Early Career Award, Geological Society of America (GSA) Hydrogeology Division

2011: Hydrologic Sciences Early Career Award, American Geophysical Union (AGU) Hydrology Section  
 AGU Editors' Citation for Excellence in Refereeing - Water Resources Research  
 AGU Editors' Citation for Excellence in Refereeing - Geophysical Research Letters

2010: National Science Foundation CAREER Award  
 G. Moses and Carolyn G. Knebel Distinguished Teaching Award (UT-Jackson School of Geosciences)

2009: Top Referee Award, Journal of Hydrology (Elsevier)  
 Big XII Faculty Fellowship

2008: Balik Scientist, Department of Science and Technology, Republic of the Philippines

2007: G. Moses and Carolyn G. Knebel Distinguished Teaching Award (UT-Jackson School of Geosciences)

2006: Plenary Speaker for the 2<sup>nd</sup> Gordon Research Conference on Permeable Sediments

2005: American Geophysical Union Horton Research Grant (Hydrology Section)  
 New Mexico Water Resources Research Institute Student Grant

2004: American Geophysical Union Outstanding Student Paper Award (Hydrology Section)

2003: CH2M-Hill Outstanding Hydrology Teaching Assistant (New Mexico Tech)

2002-2006: Frank M. Kottowski Fellowship (New Mexico Tech)

2002: Sigma Gamma Epsilon National Honor Society for the Earth Sciences

2001: American Association of Petroleum Geologists Paul Danheim Nelson Award

2001: Nebraska Geological Society Yatkola-Edwards Research Grant

2000 and 2001: University of Nebraska-Lincoln Department of Geosciences Summer Fellowship

1999: Arthur Saldivar-Sali Award (Best Senior Thesis in Geology, University of the Philippines-Diliman)

1999: Outstanding BS Geology Graduate (University of the Philippines-Diliman)

1996-1999: Dean's List (University of the Philippines-Diliman)

#### **Honors and recognition to current and former supervised students and post-docs**

##### **2021**

Office of Science Graduate Student Research Award (Dept. of Energy) – Anna Turetcaia

##### **2020**

National Science Foundation Graduate Research Fellowship – William Nguyen  
 NASA Earth and Space Science Fellowship – Sophy Wu (as co-supervisor; supervised by Ann Chen)  
 Best Poster Presentation (2<sup>nd</sup> place), Jackson School Annual Research Symposium – Micaela Pedrazas

##### **2019**

Outstanding Teaching Assistant UT-DGS – Stephen Ferencz  
 Geol. Soc. of America Student Research Grant – Cansu Demir  
 Geol. Soc. of America Student Research Grant – Micaela Pedrazas  
 Ivanhoe Foundation Fellowship – Micaela Pedrazas  
 Best Seminar Award UT-DGS – Michael O'Connor

##### **2018**

Fulbright Fellowship (Turkish Fulbright Commission) – Cansu Demir  
 Linus Pauling Distinguished Postdoctoral Fellowship (Pacific Northwest Nat. Lab.) – Matthew Kaufman  
 Office of Science Graduate Student Research Award (Dept. of Energy) – Michael O'Connor  
 Best Undergraduate Presentation, Jackson School Annual Research Symposium – Sebastian Muñoz

##### **2017**

American Geophysical Union Horton Research Grant – Michael O'Connor  
 American Geophysical Union Outstanding Student Paper Award – Sebastian Muñoz  
 American Geophysical Union Outstanding Student Paper Award – Matthew Kaufman  
 CUAHSI Pathfinder Fellowship – Michael O'Connor

##### **2016**

UT-DGS Outstanding Teaching Assistant – Michael O'Connor  
 American Assoc. of Petroleum Geologists Student Research Grant – Michael O'Connor

Geol. Soc. of America Student Research Grant – Michael O’Connor  
Geol. Soc. of America Student Research Grant – Stephen Ferencz  
Geol. Soc. of America Student Research Grant – Matthew Kaufman  
Outstanding Graduate Student in UT Hydrogeology Field Camp – Stephen Ferencz

**2015**

Geol. Soc. of America Student Research Grant (Outstanding Proposal) – Michael O’Connor  
Geol. Soc. of America Alexander Sisson Research Award – Michael O’Connor  
USGS Mendenhall Postdoctoral Research Fellow – Kevin Befus

**2014**

American Geophysical Union Outstanding Student Paper Award – Matthew Kaufman  
American Geophysical Union Outstanding Student Paper Award – Kevin Befus  
American Geophysical Union Horton Research Grant – Kevin Befus  
Best MS Student Presentation, Jackson School MS Student day – Alyse Briody  
Best Represented Research Group (1<sup>st</sup> Place), Jackson School Annual Research Symposium  
Outstanding Graduate Student in UT Hydrogeology Field Camp – Matthew Kaufman

**2013**

American Assoc. of Petroleum Geologists Frank E. Kottowski Memorial Grant – Lichun Wang

**2012**

Petroleum School of Norway Travel Award – Kuldeep Chaudhary  
Ivanhoe Foundation Fellowship – Raquel Flinker

**2011**

Ozarka Earth Science Scholarship – Kevin Befus  
American Geophysical Union Outstanding Student Paper Award – Audrey Sawyer  
Geol. Soc. Of America Student Research Grant – Kevin Befus  
Geol. Soc. Of America Student Research Grant (Outstanding Proposal) – Peter Zamora  
ExxonMobil Student Research Grant – Kuldeep Chaudhary  
ConocoPhillips SPIRIT Scholar – Kuldeep Chaudhary  
University of Texas COOP Undergraduate Research Fellowship – Ben Bass  
National Science Foundation Graduate Research Fellowship – Anne Dunckel

**2010**

Assoc. Sci. of Limnology & Oceanography Summer Meeting Outstanding Student Poster – Audrey Sawyer  
National Science Foundation Graduate Research Fellowship – Katy Gerecht  
Geol. Soc. of America Student Research Grant (Outstanding Proposal) – Kuldeep Chaudhary  
Massachusetts Water Resour. Res. Conf. First Place Student Poster – Katy Gerecht  
UT-DGS Tech Sessions Outstanding MS Student Presentation – John Nowinski  
UT-DGS Tech Sessions Outstanding MS Student Presentation – Travis Swanson  
ConocoPhillips SPIRIT Scholar – Travis Swanson

**2009**

American Geophysical Union Horton Research Grant – Audrey Sawyer  
Geol. Soc. of America Student Research Grant – Travis Swanson  
Geol. Soc. of America Student Research Grant – John Nowinski  
James A. Gibbs Hydrogeology and Engineering Geology Graduate Fellowship – Blair Stanley (now Francis)  
ConocoPhillips SPIRIT Scholar – Blair Stanley (now Francis)  
ConocoPhillips SPIRIT Scholar – Travis Swanson  
Hess Fellowship – Travis Swanson

**2008**

Geol. Soc. of America Student Research Grant – Blair Stanley (now Francis)  
UT-DGS Outstanding Teaching Assistant – Audrey Sawyer  
Geol. Soc. of America Student Research Grant (Outstanding Proposal) – Audrey Sawyer

American Assoc. of Petroleum Geologists Student Research Grant – Audrey Sawyer  
 BP Fellowship – John Nowinski  
 University of Texas COOP Undergraduate Research Fellowship – Anne Dunckel  
 Jackson School of Geosciences Merit Scholarship – Anne Dunckel  
 University Honors and Recognized Dean's List – Anne Dunckel

**2007**

Noble Energy Fellowship – Blair Stanley (now Francis)

**Advising, Mentoring, and Supervision**

**Post-doctoral fellows, serves or served as supervisor or co-supervisor (denoted by \*):**

<b>Name</b>	<b>Period</b>	<b>Most recent known position</b>
Lichun Wang	2015-2018	Assoc. Professor, Tianjin University
Wen Deng	2010 - 2014	Asst. Professor, Missouri Univ. of Sci. and Technol.
Benjamin Hardt*	2010 - 2012	Mendenhall Postdoctoral Fellow, USGS
Judson Partin*	2008 - 2011	Research Associate, UT Inst. for Geophysics

**PhD students, serves or served as supervisor:**

<b>Name</b>	<b>Started under my supervision</b>	<b>Passed candidacy</b>	<b>Graduation</b>
Tyson McKinney	Fall 2020	na	In progress
William Nguyen	Fall 2020	na	In progress
Cansu Demir	Fall 2018	Fall 2020	In progress
Anna Turetcaia	Fall 2017	Spring 2019	In progress
Stephen B. Ferencz	Fall 2015	Fall 2017	Spring 2020
Michael T. O'Connor	Fall 2014	Spring 2016	Spring 2019
Matthew H. Kaufman	Fall 2013	Spring 2015	Summer 2018
Eric J. Gultinan	Fall 2013	Spring 2015	Summer 2018
Lizhi Zheng	Fall 2012	Spring 2014	Summer 2017
Lichun Wang	Fall 2010	Spring 2012	Summer 2015
Peter B. Zamora	Fall 2010	Spring 2012	Summer 2015
Kevin M. Befus	Fall 2010	Spring 2012	Summer 2015
Kuldeep Chaudhary	Spring 2010	Fall 2010	Summer 2013
Audrey H. Sawyer	Fall 2007	Spring 2008	Spring 2011

**MS & MA students, serves or served as supervisor:**

<b>Name</b>	<b>Started under my supervision</b>	<b>Graduation</b>
Micaela Pedrazas	Fall 2018	Spring 2020
Jeffery Watson	Fall 2014	Summer 2016
Raquel Flinker	Fall 2012	Fall 2014
Alyse Briody	Fall 2012	Summer 2014
Michael Kanarek	Fall 2012	Summer 2013
F. Alexander Norman	Fall 2010	Spring 2013
Wai Sum Chan	Fall 2010	Summer 2011
John D. Nowinski	Fall 2008	Spring 2010
Travis E. Swanson	Spring 2008	Spring 2010
Ashleigh Barber-Bomar	Summer 2008	Spring 2009

Meredith Mackey	Summer 2008	Spring 2009
Blair A. Francis (nee Stanley)	Fall 2007	Spring 2009

**BS students who worked on an undergrad or honors thesis, serves or served as supervisor:**

Name	Started under my supervision	Institution	Thesis/project completed
Christian Roumelis	Spring 2019	UT	Spring 2020
Kindra Nicholaides	Spring 2017	UT	Spring 2018
Sebastian Muñoz	Spring 2017	UT	Spring 2018
Aimee E. Ford	Spring 2014	UT	Spring 2015
Julianne P. Wooten	Fall 2012	UT	Fall 2012
Benjamin J. Bass	Fall 2010	UT	Fall 2011
Michael S. Markowski	Summer 2009	UT	Spring 2010
Katelyn E. Gerecht	Summer 2009	Smith College	Spring 2010
Anne E. Dunckel	Summer 2008	UT	Fall 2009

**BS students, served as undergraduate research assistant supervisor:**

Name	Year
Zachary Mungia	2018-2019
Sebastian Muñoz	2016-18
Kindra Nicholaides	2016-18
Lane Cockrell	2016-17
Austin Rio Mursinna	2016
Collin Roland	2016

**BS students, served as Research Experience for Undergrads or Teachers supervisor:**

Name	Institution	Year
Lauryn Martinez	Univ. of Puerto Rico-Mayaguez	2017
Hannah Leiberger	Univ. of Maryland-Baltimore Co.	2013
Nancy Pattyn	Anderson High School	2010
Katelyn Gerecht	Smith College	2009
Selene Castillo	Baylor University	2009
Anne Dunckel	Univ. of Texas	2008
Laura Merner	Clark University	2007

**Visiting students or scientists, serves or served as supervisor or host:**

Name	Date of visit	Institution	Supervisor
Fu Liao	2019-20	China Univ. of Geosciences-Beijing	Guangcai Wang
Dr. Xiaobing Chen	2019	Hohai University (China)	na
Anzy Lee	2018	Purdue University	Antoine Aubeneau
Jiaqing Zhou	2016-2017	Wuhan University (China)	Yi-Feng Chen
Xiaobing Chen	Summer 2014	Hohai University (China)	Li Chen
Adam Kessler	Spring 2013	Monash University (Australia)	Perran Cook
Tyler Cyronak	Summer 2012	Southern Cross Univ. (Australia)	Bradley Eyre
Douglas Tait	Summer 2012	Southern Cross Univ. (Australia)	Isaac Santos
Laura Bardini	Spring 2011	Politecnico di Torino (Italy)	Luca Ridolfi

Jesus Gomez	Fall 2009	New Mexico Tech	John Wilson
Louis Areepitak	Summer 2008	Texas A&M-Kingsville	Jianhong Ren
Dr. Moon-su Kim	2007-2008	Nakdong River IER (S. Korea)	na
Daniel Käser	Fall 2007	Lancaster University (UK)	Andrew Binley

**High school students supervised who worked on science projects:**

Name	Institution	Project completed
Alperen Karanci	Harmony Science Academy	Spring 2010

**Doctoral students, served or serves as dissertation committee member (graduated):**

Name	Department	Defended	Supervisor
Lingcheng Li	Geological Sciences	Summer 2020	Z.-L. Yang & Ashley Matheny
Charles Abolt	Geological Sciences	Spring 2019	Michael Young
Baiyuan Gao	Geological Sciences	Summer 2018	Peter Flemings
Peirong Lin	Geological Sciences	Spring 2018	Zong-Liang Yang
Colin McNece	Geological Sciences	Spring 2018	Marc Hesse
Allan Jones	Geological Sciences	Fall 2017	Kevan Moffett
John Warden	Geological Sciences	Fall 2016	Dan Brecker
Kimberly Gilbert	Geological Sciences	Fall 2015	Philip Bennett
Lauren Andrews	Geological Sciences	Fall 2015	Ginny Catania
Gihye Shin	Civil Engineering	Fall 2015	Ben Hodges
Brian Kiel	Geological Sciences	Spring 2015	Lesli Wood
Wendy Robertson	Geological Sciences	Spring 2014	Jack Sharp
Eugenio Santillan	Geological Sciences	Spring 2014	Philip Bennett
Kyung-won Chang	Geological Sciences	Fall 2013	Marc Hesse
Corrine Wong	Geological Sciences	Spring 2013	Jay Banner
Megan Franks	Geological Sciences	Spring 2012	Philip Bennett
Julia Schneider	Geological Sciences	Fall 2011	Peter Flemings
Erin Eastwood	Geological Sciences	Spring 2011	Gary Kocurek
Jeffrey Nittrouer	Geological Sciences	Fall 2010	David Mohrig
Donald Slotke	Geological Sciences	Spring 2010	Jack Sharp
Enrique Rosero	Geological Sciences	Spring 2009	Zong-Liang Yang
Mauricio Santillana	Comp. and Applied Math.	Spring 2008	Clint Dawson

**Doctoral students, served on candidacy exam committee:**

Name	Department	Candidacy exam	Supervisor
Zachary Murphy	Geological Sciences	Fall 2019	Peter Flemings
Alison Tune	Geological Sciences	Spring 2018	Daniella Rempe
Ningjie Hu	Geological Sciences	Spring 2018	Jake Covault
Wen-Ying Wu	Geological Sciences	Fall 2017	Zong-Liang Yang
Max Daniller-Varghese	Geological Sciences	Spring 2017	Wonsuck Kim
Lingcheng Li	Geological Sciences	Spring 2017	Zong-Liang Yang
Charles Abolt	Geological Sciences	Spring 2017	Michael Young
Alison Northup	Integrative Biology	Spring 2016	Timothy Keitt
Dmitrii Merzlikin	Geological Sciences	Fall 2015	Sergey Fomel
Colin McNece	Geological Sciences	Fall 2014	Marc Hesse

Baiyuan Gao	Geological Sciences	Fall 2014	Peter Flemings
Jenna Kromann	Geological Sciences	Spring 2014	Jack Sharp
Peirong Lin	Geological Sciences	Spring 2014	Zong-Liang Yang
Allan Jones	Geological Sciences	Spring 2014	Kevan Moffett
Gihye Shin	Civil Engineering	Spring 2013	Ben Hodges
Meredith Bush	Geological Sciences	Spring 2013	Brian Horton
Lauren Andrews	Geological Sciences	Spring 2012	Ginny Catania
Travis Swanson	Geological Sciences	Spring 2012	David Mohrig
John Warden	Geological Sciences	Spring 2012	Dan Breecker
Rudra Chatterjee	Geological Sciences	Fall 2011	John Lassiter
Wendy Robertson	Geological Sciences	Spring 2011	Jack Sharp
Virginia Smith	Geological Sciences	Fall 2010	David Mohrig
Corrine Wong	Geological Sciences	Spring 2010	Jay Banner
Eugenio Santillan	Geological Sciences	Spring 2010	Philip Bennett
Kimberly Gilbert	Geological Sciences	Spring 2010	Philip Bennett
Jeffrey Nittrouer	Geological Sciences	Spring 2009	David Mohrig
Erin Eastwood	Geological Sciences	Spring 2009	Gary Kocurek
Megan Franks	Geological Sciences	Spring 2009	Philip Bennett
Carla Sanchez	Geological Sciences	Spring 2009	Ron Steel

**Doctoral students at other institutions, serves or served on dissertation committee:**

Name	Institution	Dissertation defense	Supervisor
Danica Mancenido	University of the Philippines	December 2020	Fernando Siringan
Pin Shuai	Texas A&M University	Summer 2016	Peter Knappett
Adam Kessler	Monash University	Spring 2015	Perran Cook
Jesus Gomez	New Mexico Tech	Summer 2013	John Wilson

**MS students at other institutions, serves or served on thesis committee:**

Name	Institution	Thesis defense	Supervisor
Aljon Eligado	University of the Philippines	Summer 2020	Caroline Jaraula
Raymond S. Rodolfo	Ateneo De Manila University	Fall 2017	Rene Claveria
Rezaul Haider	Utah State University	Spring 2017	Bethany Neilson
Maria Isabel Senal	University of the Philippines	Summer 2013	Gil Jacinto

**MS students, served as thesis committee member (graduated):**

Name	Department	Graduated	Supervisor
Austin Rechner	Geological Sciences	Summer 2020	Ashley Matheny
Adenike Tokan-Lawal	Geological Sciences	Summer 2014	Peter Eichubl
L. Joy Mercier	Geological Sciences	Summer 2014	Jack Sharp
William Betts	Geological Sciences	Spring 2014	Peter Flemings
Lindsey Sydow	Geological Sciences	Summer 2013	Philip Bennett
Molly Kent	Geological Sciences	Spring 2011	Philip Bennett
Michael Passarello	Geological Sciences	Spring 2011	Jack Sharp
Jennifer Cessna	Geological Sciences	Spring 2011	Marc Hesse
Mishal Al-Johar	Geological Sciences	Fall 2010	Jack Sharp

Corrine Wong	Geological Sciences	Spring 2009	Jay Banner
Elsbeth Steinhauer	Geological Sciences	Spring 2008	Philip Bennett

**BS students, served as honors thesis committee member (graduated):**

Name	Department	Thesis defense	Supervisor
Logan Schmidt	Geological Sciences	Spring 2017	Joe Levy
Katherine Markovich	Geological Sciences	Spring 2012	Suzanne Pierce
Sarah Doyle	Geological Sciences	Spring 2010	Jack Sharp
Spencer Whitman	Geological Sciences	Spring 2010	David Mohrig
Katherine Dlubac	Geological Sciences	Spring 2008	Jack Holt
Elke Baitis	Geological Sciences	Spring 2008	David Mohrig

**Supervision of Theses and Dissertations**

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Parenthetical statement denotes immediate position of student after graduation or last known position

**Doctoral dissertations in progress:**

Tyson McKinney, started Fall 2020, topic: Dynamic surface water-groundwater regional connectivity in a monsoon and tide influenced fluvio-deltaic region

William Nguyen, started Fall 2020, topic: Reactive transport of iron and arsenic in dynamic surface water-groundwater mixing zones

Cansu Demir, started Fall 2018, topic: Coastal groundwater flow and transport in Arctic lagoons

Anna Turetaica, started Fall 2017, topic: Aerobic respiration and carbon cycling in hyporheic zones

**MS theses in progress:**

None at the moment

**Doctoral dissertations completed (including most recent known employment):**

Stephen B. Ferencz, completed Spring 2020, topic: Surface water-groundwater exchanges under conditions of daily river stage fluctuations: implications for fluid, solute, and heat dynamics in dam regulated river corridors

(Postdoctoral Fellow, Sandia National Laboratory)

Michael T. O'Connor, completed Spring 2019: Controls governing active layer thermal hydrology: How predictable subsurface properties influence thaw, groundwater flow, and soil moisture

(Geological Society of America Congressional Science Fellow)

Matthew H. Kaufman, completed Summer 2018: Physical, chemical, and microbial dynamics in the hyporheic zone

(Linus Pauling Distinguished Postdoctoral Fellow, Pacific Northwest National Laboratory)

Eric J. Guiltinan, completed Summer 2018: Multiphase flow properties of sealing caprocks for CO<sub>2</sub> geological storage

(Postdoctoral Fellow then Staff Scientist, Los Alamos National Laboratory)

Lizhi Zheng, completed Summer 2017: Nitrate removal efficiency in hyporheic zones: the effect of temperature and bedform dynamics

(Associate Professor, Tianjin Normal University)

Peter B. Zamora, completed Summer 2015, topic: Mixing dynamics of groundwater-seawater systems at the land ocean interface  
(Assistant Professor, University of North Carolina-Wilmington)

Lichun Wang, completed Spring 2015: Flow and transport through and deformation of rough fractures: analytical and numerical modeling studies  
(Associate Professor, Tianjin University)

Kevin M. Befus, completed Spring 2015, topic: Groundwater flow controls on coastal water quality and global groundwater ages  
(Assistant Professor, University of Wyoming)

Kuldeep Chaudhary, completed Summer 2013, title: Pore scale controls of fluid flow laws and the capillary trapping of CO<sub>2</sub>  
(Assistant Professor, Kent State University)

Audrey H. Sawyer, completed Spring 2011, title: Complexity in river-groundwater exchange due to permeability heterogeneity, in-stream flow obstacles, and river stage fluctuations  
(Associate Professor, Ohio State University)

**MS theses completed (including most recent known employment):**

Micaela Pedrazas, completed Spring 2020, topic: Ice-free lagoon sediment in areas of continuous Arctic permafrost revealed through electrical resistivity imaging  
(LRE Water)

Jeffery Watson, completed Summer 2016, topic: Thermal dynamics of a riparian aquifer subject to flooding: Lower Colorado River, Texas, USA  
(Hays-Trinity Groundwater Conservation District)

Raquel H. Flinker, completed Fall 2014, topic: Grassland soil moisture dynamics in response to CO<sub>2</sub> and biodiversity manipulations  
(Schlumberger, Brazil)

Alyse C. Briody, completed Summer 2014, topic: Flow, nutrient, and stable isotope dynamics of groundwater in the parafluvial/hyporheic zone of a regulated river during a small pulse  
(USGS New Mexico Water Science Center)

Michael R. Kanarek, completed Summer 2013, topic: Understanding the effects of wildfire on soil moisture dynamics, plant water uptake, and recharge using electrical resistivity  
(INTERA)

F. Alexander Norman, completed Spring 2013, title: An experimental assessment of the influence of bedforms on coupled hyporheic flow and heat transport

John D. Nowinski, completed Summer 2010, title: Intra-meander groundwater-surface water interactions in a losing experimental stream  
(CH2M)

Travis E. Swanson, completed Spring 2010, title: Heat transport and tracing within the hyporheic zone of pool-riffle-pool sequences  
(PhD student at the University of Texas at Austin, then Shell)

Blair A. Francis (nee Stanley), completed Spring 2009, title: Effects of dam-induced daily river stage fluctuations on groundwater flow paths  
(BP)

**BS honors theses in progress:**

None at the moment

### **BS honors and undergrad theses completed:**

- Christian Roumelis, completed Spring 2020: Far-field interactions between a river and an aquifer due to regulated and natural floods  
(grad student at Ohio State University)
- Sebastian Muñoz, completed Spring 2018: Heat transport variability across the streambed of a large, regulated river subject to hydropeaking  
(Fulbright Fellow, Chile)
- Kindra Nicholaides, completed Spring 2018: Arctic groundwater model informed by characterization of tundra soils  
(Southwest Research Institute)
- Aimee E. Ford, Plan II Honors, completed Spring 2015, topic: Hyporheic flow and dissolved oxygen distribution in fish nests  
(law student at the University of Michigan)
- Julianne P. Wooten, completed Fall 2012, title: Hyporheic exchange flows and biogeochemical patterns near a meandering stream: East Fork of the Jemez River, Valles Caldera National Preserve, New Mexico
- Benjamin J. Bass, completed Fall 2011, title: Seasonal soil moisture dynamics throughout a semiarid valley ecotone using quasi-3D time-lapse electrical resistivity imaging  
(graduate student at Rice University)
- Michael S. Markowski, completed Spring 2010, title: Characterizing groundwater-surface water interactions in a regulated river using electrical resistivity  
(graduate student at Texas State University)
- Anne E. Dunckel, completed Fall 2009, title: Thermal imaging of microbial mats provides clues to thermophile community structure: El Tatio Geyser, Chile  
(graduate student at the University of Virginia)

### **Professional and Public Service**

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#### **Internal service (University of Texas at Austin):**

- 2020: Internal Department Chair Candidates Interview Committee, chair, JSG  
Civil Engineering Faculty (Planet Texas 2050) Search Committee, member  
Appointments Committee, chair, JSG  
Surface and Hydrologic Processes Research Theme, leader, JSG
- 2019: Post-tenure Review Committee (Terry Quinn, Full Professor), DGS  
Third-year Pre-tenure Review Committee (Daniella Rempe, Asst. Professor), DGS  
Teaching Evaluation (Daniella Rempe, Asst. Professor), DGS  
Ad-hoc Committee for Investigation of Behavioral Issues, Graduate Studies Committee, JSG  
Appointments Committee, JSG (chair beginning fall 2019)  
Reviewer, Dr. Cécile DeWitt-Morette France-UT Endowed Excellence Grants, UT VP for Research  
Task Force on Window Signage Rules for Faculty and Staff Offices, UT Office of the President
- 2018: Appointments Committee, member, JSG
- 2017: Hydrologic and Water Science Faculty Search Committee, chair, DGS
- 2016: Committee on Strategic Plan Implementation, Graduate Studies Committee, member, JSG  
Space Management Committee, member, DGS  
MSc Program Review Committee, member, JSG  
Undergraduate Curriculum Redesign Committee, DGS
- 2015: MSc Program Review Committee, member, JSG  
Water Science Faculty Search Committee, member, DGS

- 2014: Faculty Performance Review Committee, DGS
- 2013: Faculty Performance Review Committee, DGS  
Committee for developing dissertation format and expectations, JSG  
Conceptualized, organized and led field trip to the Philippines for the JSG Undergraduate Honors Research Program
- 2012: Hydrogeology and Glaciology Discipline, leader, JSG
- 2011: Hydrogeology Faculty Search Committee, chair, DGS  
Hydrogeology and Glaciology Discipline, leader, JSG  
Admissions, Awards and Support Committee, member, JSG
- 2010: Hydrogeology and Glaciology Discipline, leader, JSG  
PhD Curricular Review and Revisions Committee, member, JSG  
Admissions, Awards and Support Committee, member, JSG  
Technical Sessions Committee, DGS, member
- 2009: BS Environmental Science Curriculum Design Committee, UT
- 2008: Earth Surface and Hydrologic Processes Faculty/ Researcher Search Committee, member, JSG
- 2007: Earth Surface and Hydrologic Processes Faculty/ Researcher Search Committee, member, JSG  
Geoscience Education Faculty Position Search Committee, member, DGS  
BS Geology Option III (Hydrogeology) Curriculum Revision Committee, chair, DGS  
Ad Hoc Undergraduate Teaching Equipment Grant Committee, member, DGS

#### **Educational Outreach:**

- 2021: Guest lecture (via Zoom), Austin ISD Kiker Elementary School, kinder class
- 2020: Speaker, Scuba Nights Lockdown Edition, Scuba Academy Manila/Scuba Schools International
- 2018: Speaker, Austin ISD Kiker Elementary School, 5<sup>th</sup> Grade career fair
- 2017: Speaker, Austin ISD Kiker Elementary School, 5<sup>th</sup> Grade career fair  
Guest lecture, Austin ISD Kiker Elementary School, kinder class
- 2016: Guest lecturer, Austin ISD Kealing Middle School, 8<sup>th</sup> Grade science class
- 2015: Public science lecture on paleoclimate and climate change to officials and employees of Puerto Princesa City, Philippines  
Guest lecturer/ field trip supervisor, Austin ISD LBJ Liberal Arts and Science Academy AP Environmental Science class  
Guest participant, University of Texas/Fish and Wildlife Service Kaktovik Marine Science Camp, Alaska
- 2014: Guest lecturer/ field trip supervisor, Austin ISD LBJ Liberal Arts and Science Academy AP Environmental Science class  
Guest lecturer, Austin ISD Kiker Elementary School, 1<sup>st</sup> Grade science class  
Resource person, Austin ISD Kiker Elementary School, 5<sup>th</sup> Grade career fair
- 2013: Guest lecturer, Austin ISD Kiker Elementary School, 5th Grade science class
- 2012: Guest lecturer/ field trip supervisor, Austin ISD LBJ Liberal Arts and Science Academy AP Environmental Science class
- 2011: Guest lecturer/ field trip supervisor, Texas A&M Wetland and Riparian Seminar  
Guest lecturer/ field trip supervisor, Austin ISD Crockett High School AP Environmental Science class  
Guest lecturer/ field trip supervisor, Austin ISD LBJ Liberal Arts and Science Academy AP Environmental Science class  
Flume experiment demonstrations, Anderson High School Environmental Systems class
- 2010: Guest lecturer, Colorado River Foundation Teacher Institute  
Guest lecturer/ field trip supervisor, Texas A&M Wetland and Riparian Seminar  
Guest lecturer/ field trip supervisor, Austin ISD LBJ Liberal Arts and Science Academy AP Environmental Science class

2009: Guest lecturer/ field trip supervisor, Texas A&M Wetland and Riparian Seminar

2008: Guest lecturer, Jackson School of Geosciences - GeoFORCE

2007-present: Participant (supervisor, lecturer and field trip leader), UT-Environmental Science Institute  
Research Experience for Undergraduates program

#### **External service:**

**Editor:** Geophysical Research Letters (2013-2019)

**Associate Editor:** Reviews of Geophysics (2010-2014); Water Resources Research (2010-2013)  
Hydrogeology Journal (2009-2012)

**Guest Paper Editor:** Proceedings of the National Academy of Sciences (2013, 2014, 2020)

#### **Manuscript reviewer:**

Advances in Water Resources; ASCE Journal of Hydrologic Engineering; Biogeosciences; Computational Geosciences; Computers and Geosciences; Ecosystems; Environmental Fluid Mechanics; Environmental Science and Technology; Eos; Estuarine, Coastal, and Shelf Science; Freshwater Science; Geography Compass; Geology; Geophysical Research Letters; Ground Water; Hydrogeology Journal; Hydrology and Earth System Sciences; Hydrological Processes; International Journal of Rock Mechanics and Mining Sciences; Journal of Environmental Management; Journal of Geophysical Research – Biogeosciences; Journal of Geophysical Research – Earth Surface; Journal of Hydrology; Journal of Marine Systems; Limnology and Oceanography; Limnology and Oceanography: Fluids and Environments; Nature; Nature Reviews Earth & Environment; PNAS; Remote Sensing of Environment; Science Advances; Science of the Total Environment; Sedimentology; Transport in Porous Media; Water Research; Water Resources Management; Water Resources Research

#### **Book chapter reviewer:**

Treatise in Fluvial Geomorphology (Elsevier)

**Proposal review panel member:** National Science Foundation (Hydrologic Sciences; Water Sustainability and Climate-Category 2); Department of Energy (Subsurface and Biogeochemical Research; Early Career Grants)

**Proposal reviewer:** National Science Foundation (Hydrologic Sciences; Major Research Instrumentation; Paleo Perspectives on Climate Change; Geomorphology and Land Use Dynamics; CAREER; Arctic Natural Sciences); Department of Energy (Basic Energy Sciences; Office of Science Graduate Student Research); Israel Science Foundation; Swiss National Science Foundation; Austrian Science Fund; Royal Society Te Aparangi (Marsden Fund); German Research Foundation; American Chemical Society-Petroleum Research Fund; United States Geological Survey National Institute for Water Resources; Graduate Women in Science Fellowships; Utah State University

#### **Committee membership in professional societies:**

2012-2014: American Geophysical Union Hydrologic Sciences Early Career Award Committee

2013-2014: Geological Society of America Hydrogeology Kohout Early Career Award Committee

2011-2013: Geological Society of America Hydrogeology Division O. E. Meinzer Award Committee

2010-2014: American Geophysical Union Hydrology Section Groundwater Technical Committee

#### **Chaired sessions in conferences:**

2020: Philippine-American Academy of Science and Engineering Annual Scientific Meeting, “Earth and Environmental Sciences” (virtual)

2012: Association for the Sciences of Limnology and Oceanography Aquatic Sciences Meeting, Lake Biwa, Japan, “Groundwater-surface water interactions in freshwater and marine environments”

- 2010: American Geophysical Union Fall Meeting, San Francisco, CA, “CO<sub>2</sub> Sequestration Inside Pores: From Molecules to Microbes” (two sessions)  
 American Geophysical Union Fall Meeting, San Francisco, CA, “Emerging Topics in Interdisciplinary Hydrology: Biogeochemistry, Ecology, and Geomorphology”
- 2009: American Geophysical Union Fall Meeting, San Francisco, CA, “Everything, everywhere, every time: Integration of high-resolution data with high-fidelity hydrologic models”
- 2008: Geological Society of America Annual Conference held in Houston TX, “Groundwater-surface water interactions”
- 2007: Geological Society of America Annual Conference held in Denver CO, “50 years of hydrogeology in the desert: A tribute to Mahdi Hantush and his legacy”
- 2006: Geological Society of America Annual Conference held in Philadelphia PA, “Stream-hyporheic Interactions: Hydrology, Geochemistry, and Biology”

## Publications

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Researcher ID: <http://www.researcherid.com/rid/B-4940-2011>

Google Scholar: <http://scholar.google.com/citations?user=peswPxUAAAAJ&hl=en&oi=ao>

Underline denotes student or post-doctoral fellow author, \* denotes undergraduate student

### Peer-reviewed papers under review or revision:

152. Lee, A., A. F. Aubeneau, **M. B. Cardenas**, and X. Liu, Hyporheic exchange due to rocks on sandy beds.
151. Ferencz, S. B., **M. B. Cardenas**, and B. T. Neilson, Aerobic respiration in riparian exchange zones of regulated river corridors.
150. Gomez-Velez, J. D., **M. B. Cardenas**, X. Chen, and T. D. Scheibe, Riverbed respiration is important for local and global CO<sub>2</sub> cycles.
149. Correa, R. E., **M. B. Cardenas**, R. S. Rodolfo, M. R. Lopus, J. C. Fullon, K. L. Davis, A. Giles, M. Hajati, N. Moosdorf, C. Sanders, I. R. Santos, Hydrothermal, CO<sub>2</sub>-rich submarine groundwater discharge to a vibrant coral reef.
148. Zamora, P. B., **M. B. Cardenas**, H. B. Cabria, and R. S. Rodolfo, Freshwater flooding of a subterranean estuary.
147. Zamora, P. B., **M. B. Cardenas**, and P. L. M. Cook, Groundwater-surface water interactions in a river estuary and the importance of geomorphology: insights from hydraulic, thermal and geophysical observations.
146. Kaufman, M. H., **M. B. Cardenas**, and R. González-Pinzón, Assessment of resazurin-resorufin tracing for estimating hyporheic zone respiration.
145. Wang, L., **M. B. Cardenas**, T. Wang, J.-Q. Zhou, L. Zheng, Y.-F. Chen, and X. Chen, Prediction of nonlinear flow in porous media.

### Peer-reviewed papers in print, in press or accepted:

2021

144. Flinker, R. H., **M. B. Cardenas**, T. G. Caldwell, G. N. Flerchinger, R. Rich, and P. B. Reich, Modeling the effects of atmospheric CO<sub>2</sub> on grassland soil moisture at a free-air CO<sub>2</sub> enrichment experiment (BioCON) using the Simultaneous Heat and Water (SHAW) model, *Pedosphere*.
143. Sobolevskaia, V., **M. B. Cardenas**, A. K. Hasanov, and P. S. K. Knappett, Aquifer diffusivity estimation through joint inversion of the amplitude ratios and time lags of dominant frequencies of fluctuating head, *Water Resources Research*, 57(6), doi: 10.1029/2020WR027912, 2021.
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3. **Cardenas, M. B.**, J. L. Wilson, and V. A. Zlotnik, Impacts of heterogeneity, bed forms, and stream curvature on subchannel hyporheic exchange, *Water Resources Research*, 40, W08307, doi: 10.1029/2004WR003008, 2004.
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#### Books or book chapters:

- Lawler, D., **M. B. Cardenas**, G. Old, and D. Sear, Geomorphology and Sediments of the Hyporheic Zone, In *The Hyporheic Handbook: A handbook on the groundwater–surface water interface and hyporheic zone for environment managers*, UK Environment Agency, pp 16-47, 2009.
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## Scholarly Presentations

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#### Invited lectures:

#### 2020

Old Dominion University – “Coastal groundwater, coral reefs, calderas and carbon cycling: Connections that

are common?"

Geological Society of the Philippines (webinar) – “Groundwater and surface water as a single resource: novel insight from Philippine studies”

University of Dhaka-“A global perspective on groundwater resources: renewability, vulnerability, and elasticity”

#### **2019**

Goldschmidt Meeting-“Cascading disequilibrium: a glimpse into dynamic hydro-biogeochemical processes in hyporheic zones”

University of the Philippines-Marine Science Institute-“Land-ocean subsurface connections in volcanic terrain and its impact on coastal ocean acidification”

#### **2018**

American Geophysical Union Fall Meeting- “Perpetual hyporheic motion (and reaction): A glimpse into the dynamic world of the hyporheic zone”

International Association for Hydro-Environment Engineering and Research Groundwater Symposium (Nanjing, China)- “A global perspective on groundwater age and turnover rates: renewability, vulnerability, and elasticity”

International Association of Hydrogeologists Congress- “Denitrification in the banks of fluctuating rivers: the effects of river stage amplitude, sediment hydraulic conductivity and dispersivity, and ambient groundwater flow”

University of Southern Denmark- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

Göttingen University, Germany- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

Tuebingen University, Germany- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

#### **2017**

Hohai University, China- “How the pulse of a river affects its liver”

Wuhan University, China- “A global perspective on groundwater resources: renewability, vulnerability, and elasticity” and “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

China University of Geosciences, Wuhan, China - “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

Oak Ridge National Laboratory- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

University of Utah- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

Pacific Northwest National Laboratory- “A global perspective on groundwater resources: renewability, vulnerability, and elasticity” and “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

University of the Philippines-Diliman (Geological Sciences)- “A global perspective on groundwater age and turnover rates: renewability, vulnerability, and elasticity”

University of Texas Bureau of Economic Geology- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

Johns Hopkins University- “Water cycling across aquatic interfaces: how it works and why it matters from the pore to the continental scale”

University of Nebraska-Lincoln- “Water cycling across aquatic interfaces and why it matters from the pore scale to the continental scale”

#### **2016**

China University of Geosciences- Beijing- “Taking stock of Earth’s groundwater and its renewability”

China University of Geosciences- Beijing- “Water cycling across aquatic interfaces and why it matters from the pore scale to the continental scale”

Hohai University, China- “Taking stock of Earth’s groundwater and its renewability”

Hohai University, China- “Water cycling across aquatic interfaces and why it matters from the pore scale to the continental scale”

#### **2015**

American Geophysical Union Fall Meeting- “Devastation of aquifers from super typhoon Haiyan’s storm surge”

Palawan State University, Philippines- “Paleo-climate insights from Palawan stalagmites: the Western Pacific region’s response to global climate change”

Western Palawan University, Philippines - “Paleo-climate insights from Palawan stalagmites: the Western Pacific region’s response to global climate change”

Holy Trinity University, Puerto Princesa, Philippines- “Paleo-climate insights from Palawan stalagmites: the Western Pacific region’s response to global climate change”

Baylor University (Geology)- “Water cycling across aquatic interfaces and why it matters from the pore scale to the continental scale”

Mapua Institute of Technology, Philippines (Civil, Environmental, and Geological Engineering)- “Devastation of aquifers from super typhoon Haiyan’s storm surge”

Mapua Institute of Technology, Philippines (Civil, Environmental, and Geological Engineering)- “Taking stock of Earth’s groundwater and its renewability”

Ateneo de Manila University, Philippines (Environmental Science)- “Devastation of aquifers from super typhoon Haiyan’s storm surge”

University of the Philippines-Los Baños, Philippines (Environmental Science and Management)- “Devastation of aquifers from super typhoon Haiyan’s storm surge”

University of the Philippines- Los Baños, Philippines (Environmental Science and Management)- “Taking stock of Earth’s groundwater and its renewability”

University of the Philippines-Diliman (Geological Sciences)- “Devastation of aquifers from super typhoon Haiyan’s storm surge”

University of the Philippines-Diliman (Geological Sciences)- “Taking stock of Earth’s groundwater and its renewability”

University of Michigan (Earth and Environmental Sciences)- “Water cycling across aquatic interfaces, and why it matters from the pore scale to the continental scale”

#### **2014**

European Geosciences Union, Vienna, Austria- “The residence times of surface water-groundwater exchange from  $10^{-3}$  to  $10^3$  m and why long tails matter”

#### **2013**

American Geophysical Union Fall Meeting- “The old and the new: the use of classical regional groundwater flow models to address problems of the future”

University of Wisconsin-Madison (Civil and Environmental Engineering)- “River-groundwater interactions: local processes with global consequences”

University of Wisconsin-Madison (Geoscience)- “Terrestrial smokers: thermal springs due to hydrothermal convection of groundwater connected to surface water”

University of the Philippines-Diliman (Geological Sciences)- “Pore-scale controls on the trapping of supercritical  $\text{CO}_2$  in reservoirs”

University of the Philippines-Diliman (Marine Science)- “Groundwater inputs into the coastal ocean: large-scale patterns, local dynamics, and implications on material and energy budgets”

Oregon State University (Water Resources Seminar)- “Coupled processes along the surface water-groundwater interface: advances from modeling and measurements”

Portland State University and USGS- “How the pulse of a river affects its liver”

## 2012

- American Geophysical Union Fall Meeting- "Applications of electrical resistivity imaging for characterizing groundwater-surface water interactions from local to regional scales"
- Texas Riparian Association Annual Meeting- "How the pulse of a river affects its liver"
- University of Virginia (Civil and Environmental Engineering)- "How the pulse of a river affects its liver"
- University of Virginia (Environmental Sciences)- "Coupled processes along the surface water-groundwater interface: advances from modeling and measurements"
- University of Virginia (Environmental Sciences)- "Coastal sediment as bio-geo-reactors powered by waves"
- University of the Philippines-Diliman (Geological Sciences)- "How can a limestone outcrop warm up a very cold river?"
- University of the Philippines-Diliman (Geological Sciences)- "Discovery and analysis of 'terrestrial smokers' in Taal Volcano"
- University of the Philippines-Diliman (Geological Sciences)- "Geophysical imaging of ground water-surface water interactions in rivers, lakes and the coastal ocean"
- University of Texas - Marine Science Institute- "Groundwater inputs into the coastal ocean: large-scale patterns, local dynamics, and implications on material and energy budgets"

## 2011

- Texas A & M University (Water Resources Seminar)- "Coastal sediment as bio-geo-reactors powered by waves"
- River Corridor Restoration Conference 2011 Keynote Lecture (EAWAG: Swiss Federal Institute of Aquatic Science and Technology, Switzerland)- "River-aquifer connectivity as a restoration target: what, why and how"
- University of California-Berkeley (Civil and Environmental Engineering)- "The surface water-groundwater continuum: hydraulics, biogeochemistry and geophysics"

## 2010

- American Geophysical Union Fall Meeting- "Integrating turbulent flow, biogeochemical, and poromechanical processes in rippled coastal sediment"
- American Geophysical Union Fall Meeting- "Detection and characterization of local to regional groundwater inputs to rivers, lakes and oceans with electrical imaging"
- University of the Philippines-National Institute of Geological Sciences- "The effects of river dynamics on river-aquifer interactions"
- American Society of Limnology and Oceanography Aquatic Sciences Meeting- "Fluid dynamic interactions near sediment-water interfaces in aquatic and coastal environments"
- University of Texas at San Antonio (Water Resources Seminar)- "Effects of dams on groundwater-surface water interactions"
- American Geophysical Union/American Society of Limnology and Oceanography/ The Oceanography Society Ocean Sciences Joint Meeting- "Time-averaged versus transient forcing by waves of porewater circulation and transport in permeable sediment"

## 2009

- American Geophysical Union Fall Meeting- "Effects of inertia and directionality on flow and transport in a fracture"
- Geological Society of America Annual Conference- "The familiar as a frontier: persistent transient stream-groundwater interactions"
- University of Texas at Arlington (Geology)- "Coastal sediment as bio-geo-reactors powered by waves"
- Max-Planck Institute for Marine Microbiology, Bremen, Germany- "Constraining denitrification in permeable coastal sediment using linked biogeochemical and hydrodynamic models"
- European Geosciences Union, Vienna, Austria- "Towards the 'hyporheic meter'-predicting hyporheic exchange from bedforms to bars to bends"

## 2008

University of the Philippines-Diliman (Geological Sciences)-“Power-law scaling of residence times: the geomorphological signature of ground water-surface water connection at nested scales”  
University of the Philippines-Diliman (Marine Science)- “Constraining denitrification in permeable coastal sediment using linked biogeochemical and hydrodynamic models”  
University of Minnesota (St. Anthony Falls Laboratory/ National Center for Earth Surface Dynamics)-  
“Surface water-groundwater interactions across scales”

#### 2007

American Geophysical Union Fall Meeting- “Understanding processes in streambeds with reductive models and high-resolution data”  
Geological Society of America Annual Conference- “Power-law scaling of residence times: the geomorphological signature of ground water-surface water connection at nested scales”  
University of Lancaster (Hyporheic Zone Network Keynote Lecture)- “Exchange across the surface water-ground water interface from bedforms to bends to basins”  
University of Texas at Austin (Inst. of Geophysics)- “Complex surface water-ground water interactions revealed”  
University of Nevada-Reno (Graduate Program of Hydrologic Sciences)-“Understanding surface water-ground water interactions from bedforms to basin using high-fidelity models”

#### 2006

Gordon Research Conference on Permeable Sediments Plenary Lecture- “Dynamics of fluids, solutes, and heat along sediment-water interfaces: a multiphysics modeling study”  
American Geophysical Union Fall Meeting- “Multiphysics modeling of processes along sediment-water interfaces: towards fundamental understanding and mechanistic predictions”  
Geological Society of America Annual Conference- “Flumes, finite-elements, field observations, Fourier-series and fractals: fundamental linkages in hyporheic zone research”  
University of Texas at Austin (Geological Sciences)- “The surface water-groundwater interface: crossing boundaries”  
University of Virginia (Environmental Sciences)- “The surface water-groundwater interface: crossing boundaries”  
University of Wyoming (Geology and Geophysics)- “The surface water-groundwater interface: crossing boundaries”  
University of Pittsburgh (Geology and Planetary Science)- “The surface water-groundwater interface: crossing boundaries”  
Georgia State University (Geosciences)- “The surface water-groundwater interface: crossing boundaries”

## Research Grants

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### Current or funded projects:

Collaborative Research: The physical and chemical dynamics of groundwater flow across the land-sea interface in Arctic lagoon ecosystems, funded by *National Science Foundation* (\$1,273,700, UT portion-\$794,976), UT (lead institution) PI: M. Bayani Cardenas, co-PI: James McClelland, Woods Hole Oceanographic Inst. PI: Matthew Charette, 2020-2023.  
Collaborative Research: The dynamic iron curtain surrounding fluctuating rivers and its impacts on arsenic fate and transport, funded by *National Science Foundation* (\$849,986, UT portion-\$253,841), UT PI: M. Bayani Cardenas, Texas A&M Univ. (lead institution) PI: Peter Knappett, UT San Antonio PI: Saugata Datta, 2019-2022.  
Advancing InSAR Technology for Monitoring and Prediction of the Hydrologic State of Permafrost Terrain in the Arctic, pending with the *National Aeronautics and Space Administration* (\$600,000, UT portion-\$305,000), UT PI and lead: Jingyi Chen, co-PI: M. Bayani Cardenas, Univ. of Michigan PI: George Kling  
Respiration in hyporheic zones: connecting mechanics, microbial biogeochemistry, and models, funded by

the *Department of Energy-Biological and Environmental Research* (\$600,000), UT PI and lead: M. Bayani Cardenas, Pennsylvania State University PI: Xiaofeng Liu, PNNL PIs: Xingyuan Chen, Maoyi Huang, and James C. Stegen, 2017-2020.

#### **Completed projects:**

- Collaborative Research: The effects of river regulation on lateral and integrated longitudinal mass and energy transfers in coupled terrestrial-aquatic systems, funded by *National Science Foundation* (\$682,264, UT portion-\$360,923), UT PI (lead institution): M. Bayani Cardenas, co-PI: Philip Bennett, Utah State Univ. PI: Bethany Neilson, 2014-2017.
- Center for Frontiers of Subsurface Energy Security, funded by the *Department of Energy-Basic Energy Sciences* (\$10,920,000 UT team), PI: Larry Lake, co-PI: M. Bayani Cardenas (1 of 20 PIs at UT), 2014-2018.
- The effects of typhoon Haiyan's storm surge on coastal aquifers, funded by *National Science Foundation* (\$49,581), PI: M. Bayani Cardenas, co-PI: Philip Bennett
- CAREER: Multiphysics research and education for understanding coupled mechanical-biogeochemical surface-subsurface processes, funded by *National Science Foundation* (\$569,390), sole-PI: M. Bayani Cardenas, 2010-2015.
- Collaborative Research: Holocene hydrologic variability across the Western Pacific Warm Pool, funded by *National Science Foundation* (\$504,522), PI: Judson Partin, co-PIs: Jay Banner, Fred Taylor, M. Bayani Cardenas, 2010-2013.
- Center for Frontiers of Subsurface Energy Security: Task 1, Subpore Processes, funded by *Department of Energy-Basic Energy Sciences* (\$1,650,000 out of a total of \$15.5M awarded to UT team), PI: Philip Bennett, co-PI: M. Bayani Cardenas, 2009-2014.
- Quantification of denitrification in permeable sediments using a combination of measurements and two-dimensional modeling, funded by *Australian Research Council - Discovery Projects* (\$160,000), PI: Perran L. M. Cook (Monash University, and grant is administered at Monash University), co-PI: M. Bayani Cardenas, 2009-2012.
- Assessing, quantifying, and predicting the role of large wood debris as a driver of hydrologic connectivity, funded by *National Science Foundation* (\$282,683): sole PI: M. Bayani Cardenas, 2009-2012.
- Paleoclimate of the Western Pacific Warm Pool, funded by *University of Guam* (\$80,000), PI: Jay Banner, co-PIs: M. Bayani Cardenas, Fred Taylor, Terry Quinn, 2008-2010.
- Balik Scientist Program, funded by *Philippine Department of Science and Technology* (\$7,000): M. Bayani Cardenas, 2008.
- Measurement and ecological implications of multi-scale three-dimensional geomorphology-driven surface water-ground water connections at the Outdoor Stream Lab, funded by *National Center for Earth Surface Dynamics* (a National Science Foundation Science and Technology Center) Visitor Program (\$28,300): Visiting PI: M. Bayani Cardenas, 2008.
- Hydrodynamics of groundwater-surface water interactions in gaining and losing channels: an experimental study, funded by *University of Texas Faculty Development Program Summer Research Assignment* (funded for two months summer support): M. Bayani Cardenas. 2007.
- Current-topography driven exchange processes between water columns and heterogeneous permeable sediments, funded by *American Chemical Society-Petroleum Research Fund* (\$40,000), sole-PI: M. Bayani Cardenas, 2008-2010
- Hydrodynamics of flow along and across sediment-water interfaces: a multiphysics modeling study, funded by the *American Geophysical Union* (Horton Research Grant) for \$10,000, 2006, PI: Audrey H. Sawyer.
- Numerical investigation of fluid flow above and below sediment-water interfaces, funded by the *New Mexico Water Resources Research Institute* for \$5000, 2006
- Travel Grants from the New Mexico Tech Graduate Student Association

## Courses Taught and Developed

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### University of Texas at Austin

The numbers in parentheses denote in order: number of students completing the course survey, instructor rating (out of 5), and course rating (out of 5). UT averages are 4.4 and 4.1, and college (Jackson School) averages are 4.2 and 3.9.

- 2020:** Fall: GEO 476K\* and 391C\* (Groundwater Hydrology) (5, 5.0, 4.8)  
Spring: GEO 346C\*\* (Intro. to Physical and Chemical Hydrogeology) (10, 4.9, 4.8)  
\* class was held virtually except for two lab sessions  
\*\* class was interrupted by the COVID-19 pandemic and shifted to on-line after spring break
- 2019:** Fall: GEO 476K and 391C (Groundwater Hydrology) (10, 4.8, 4.6; 2, 5.0, 5.0)  
Spring: GEO 346C (Intro. to Physical and Chemical Hydrogeology) (26, 4.4, 4.1)
- 2018:** Fall: GEO 476K (Groundwater Hydrology) (16, 4.2, 3.9)  
Spring: GEO 303 (Introduction to Geology) (86, 4.0, 3.7)
- 2017:** Summer: GEO 376L (Field Methods in Hydrogeology) (5, 4.8, 4.8)  
Spring: GEO 371C and 391C (Intro. to Mathematical Modeling for Geoscientists) (12, 4.3, 4.1)
- 2016:** Fall: GEO 376S and 382S (Physical Hydrology, grad and undergrad classes taught jointly) (20, 5.0, 4.8)  
Summer: GEO 376L (Field Methods in Hydrogeology) (15, 4.8, 4.7)  
Spring: GEO 346C (Intro. to Physical and Chemical Hydrogeology) (21, 4.6, 4.6)
- 2015:** Fall: GEO 376S and 382S (Physical Hydrology, grad and undergrad classes taught jointly) (12, 4.4, 4.3)
- 2014:** Fall: GEO 376S and 382S (Physical Hydrology, grad and undergrad classes taught jointly) (22, 3.5, 3.3)  
Summer: GEO 376L (Field Methods in Hydrogeology) (17, 4.8, 4.5)  
Spring: GEO 371C and 391C (Intro. to Mathematical Modeling for Geoscientists) (13, 4.5, 4.2)
- 2013:** Fall: GEO 376S and 382S (Physical Hydrology) (20, 4.3, 3.9)
- 2012:** Fall: GEO 376S and 382S (Physical Hydrology, grad and undergrad classes taught separately)  
(17, 4.6, 4.2) (21, 4.5, 4.2)  
Summer: GEO 376L (Field Methods in Hydrogeology) (18, 4.9, 4.9)  
Spring: GEO 382G (Fluid Physics for Geologists) (7, 4.3, 3.7)
- 2011:** Fall: GEO 376S and 382S (Physical Hydrology, grad and undergrad classes taught separately)  
(19, 4.4, 4.2) (8, 3.9, 3.9)
- 2010:** Fall: GEO 376S and 382S (Physical Hydrology, grad and undergrad classes taught separately)  
(19, 4.2, 3.9) (9, 4.0, 4.0)  
Summer: GEO 376L (Field Methods in Hydrogeology)  
Spring: GEO 346C (Intro. to Physical and Chemical Hydrogeology) (45, 3.7, 3.4)
- 2009:** Fall: GEO 376S and 382S (Physical Hydrology) (17, 4.8, 4.3)  
Summer: GEO 392M (Modern Geological Sciences-UTeach)  
Spring: GEO 346C (Intro. to Physical and Chemical Hydrogeology) (44, 4.4, 4.0)
- 2008:** Fall: GEO 376s and 382S (Physical Hydrology)  
Summer: GEO 376L (Field Methods in Hydrogeology) (9, 4.4, 4.5)  
Spring: GEO 346C (Environmental Hydrogeology) (36, 4.4, 4.1)  
GEO 391C (Surface water-groundwater interactions) (11, 4.4, 3.6)
- 2007:** Fall: GEO 376S and 382S (Physical Hydrology) (14, 4.4, 4.1)  
Summer: GEO 376L (Field Methods in Hydrogeology)  
Spring: GEO 346C (Environmental Hydrogeology) (35, 4.6, 4.3)

### New Mexico Inst. of Mining and Technology (as Graduate Teaching Assistant)

- 2004:** Fall: HYD 532 (Groundwater Modeling)  
Spring: HYD 508 (Flow and Transport in Geophysical Systems)

**University of Nebraska-Lincoln** (as Graduate Teaching Assistant)

**2002:** Spring: GEO 101 lab (Introductory Geology Lab, 2 sections per semester)

**2001:** Spring and Fall: GEO 101 lab (Introductory Geology Lab, 2 sections per semester)

**2000:** Spring: GEO 101 lab (Introductory Geology Lab, 2 sections per semester)

Fall: Structural Geology

**1999:** Fall: GEO 101 lab (Introductory Geology Lab, 2 sections per semester)