

# Randall Holmes

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## EDUCATION

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- PhD **Stanford University**, Emmett Interdisciplinary Program in Environment and Resources  
(Expected June 2022) Co-advisors: Scott Fendorf and Leon Szeptycki
- MS **Stanford University**, Earth System Science (Expected January 2018)  
Advisor: Scott Fendorf
- BS **Stanford University**, Civil and Environmental Engineering, Atmosphere and Energy track, 2015  
Advisor: Lynn Hildemann

## PROFESSIONAL EXPERIENCE

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### **Source Operations Instructor**, United States Army

Human Intelligence Training – Joint Center of Excellence, Fort Huachuca, Arizona  
September 2009 – October 2011

- Instructed over 900 students of all ranks and edited over 2000 reports.
- Accomplished command directives with little to no supervision required.
- Taught merits of cultural sensitivity during mission planning.

### **Noncommissioned Officer**, United States Army

Defense Language Institute Foreign Language Center, Monterey, California  
November 2007 – August 2009

- Won Installation Soldier of the Quarter Board.
- Trained enlisted members on combat operations and principles of Army leadership.

### **Team Leader for Human Intelligence Collection Team**, United States Army

Ramadi, Al Anbar Province, Iraq

August 2006 – November 2007

- Mentored 7<sup>th</sup> Division Iraqi Army Intelligence Officers in bilateral intelligence program.
- Presented weekly oral briefing summaries and wrote over 200 assessments of conditions in Iraq.
- Developed and implemented team operation plans for 15 months in high tempo Multi-National Forces battlefield environment.

### **Human Intelligence Collector Trainee**, United States Army

Fort Sill, Oklahoma; Fort Huachuca, Arizona; Fort Hood, Texas

June 2005 – August 2006

## PUBLICATIONS

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- [6] **Holmes, R.T.**, Al Jaaman, H., Rupp, E., Vishal, V., Kovscek, A., Wilcox, J. Idealized shales for Rigorous Shale Experiments. In review.
- [5] **Holmes, R.T.**, Rupp, E., Vishal, V. Wilcox, J. Selection of shale preparation protocol and outgas procedures for applications in low-pressure analysis. *Energy Fuels*, **2017**, *31* (9), pp 9043–9051 DOI: 10.1021/acs.energyfuels.7b01297
- [4] Psarras, P., **Holmes, R.T.**, Vishal, V., Wilcox, J. Methane and CO<sub>2</sub> adsorption capacities of kerogen in the Eagle Ford shale from molecular simulation. *Acc. Chem. Res.* *50*(8), pp 1818–1828 DOI: 10.1021/acs.accounts.7b00003
- [3] AlJaaman, H., **Holmes, R.T.**, Vishal, V., Wilcox, J., Kovscek, A. (2017). CO<sub>2</sub> Storage and Flow Capacity Measurements on Idealized Shales from Dynamic Breakthrough Experiments. *Energy and Fuels*. DOI: 10.1021/acs.energyfuels.6b02286
- [2] He J., To J. W. F., Psarras P. C., Yan H., Atkinson T., **Holmes R. T.**, Nordlund D., Bao Z., Wilcox J. (2016). Tunable Polyaniline-Based Porous Carbon with Ultrahigh Surface Area for CO<sub>2</sub> Capture at Elevated Pressure. *Adv. Energy Mater.* *6*: 1502491. DOI: 10.1002/aenm.201502491
- [1] Jacobson, M.Z., *et al.* (2016). A 100% wind, water, sunlight (WWS) all-sector energy plan for Washington State. *Renewable Energy* *86*, 75-89.

## RESEARCH EXPERIENCE

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### Stanford Ignite Full-time Session

Graduate School of Business, Stanford University, Stanford, California

June 2016 – July 2016

- Designed a non-profit venture, Brick Sanitation Solutions, with a Stanford Ignite team that pitched a venture with a portfolio of sanitation solutions for refugee camps to potential investors.
- Conducted marketing, financial, and social analyses to provide culturally appropriate and economically viable solutions to sanitation crises at refugee camps in Kenya and Ethiopia.

### Graduate Researcher: Naturally Occurring Hexavalent Chromium Mobilization

Soil and Environmental Biogeochemistry Laboratory, Stanford University, Stanford, California

Advisor: Professor Scott Fendorf

September 2015 – Present

- Consulted toxic tort litigation attorneys at Clausen Miller, PC, on California EPA water quality standards, geochemistry background, and remediation considerations in support of the 2015 Annual Conference for The Forum for Environmental and Toxic Tort Issues (FETTI) held in Chicago.
- Researched hexavalent chromium thermodynamics, environmental problems, and remediation.

**Graduate Researcher: Low Pressure Adsorption Properties of Shale**

Clean Energy Conversions Laboratory, Stanford University, Stanford, California

Advisor: Professor Jen Wilcox

September 2013 – August 2016

- Researched low pressure adsorption isotherms to find pore volume, pore size distributions, and surface areas in shales for applications in estimating capacity for geologic sequestration of CO<sub>2</sub> and data to support better modeling.

**Graduate Researcher: The Solutions Project**

Stanford University, Stanford, California

Advisor: Professor Mark Z. Jacobson

Autumn Quarter 2013

- Researched and identified dispatchability of hydroelectricity on the Columbia River, accounting for water rights and the legal constraints of Washington State.

**Undergraduate Research Assistant: Computational Chemistry**

Center for Global and Regional Environmental Research, University of Iowa, Iowa City, Iowa

Summer Quarter 2013

Advisors: Professor Gregory Carmichael, Professor Sara E. Mason

- Conducted Mulliken population analyses, studied keggin structures.
- Researched ab initio DFT applications, calculated PDOS.
- Optimized molecular geometry in DMol3/COSMO.

**Undergraduate Field Assistant: Stream Gauge Sensor Installation**

Iowa Institute for Hydraulic Research (IIHR), Center for Global and Regional Environmental Research, University of Iowa, Iowa City, Iowa

Summer Quarter 2013

Advisors: Professor Witold Krajewski; Iowa Flood Center Project Engineer, Dan Ceynar

- Maintained, assembled, and installed high precision rain and stream gauges across Iowa.

**Undergraduate Research Assistant: Soil Carbon and Nitrogen Analysis**

Stanford University, Stanford, California

Summer Quarter, 2012

Laboratories of Professor Rodolfo Dirzo and Professor Peter Vitousek

- Prepared and processed 554 soil samples using Carlo Erba CN elemental analyzer.
- Sorted and catalogued over 1800 foreign soil samples.

**Undergraduate Research Assistant: Ecocriticism**

Stanford University, Stanford, California

Spring Quarter 2012

Advisor: Professor Ursula Heise

- Researched environmental regulations written in Arabic.
- Translated key legislation from Arabic to English.

## CONFERENCES

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- 2016 **Groundwater Resources Association of California 25<sup>th</sup> Annual Meeting.** Attendee.  
Concord, California
- 2015 **Gordon Research Conference: Carbon Capture, Storage, and Utilization.** Poster: “Idealized Shale Sorption Isotherm Measurements to Determine Pore Volume, Pore Size Distributions, and Surface Area”  
Easton, Massachusetts
- 2014 **American Geophysical Union Fall Meeting.** Poster: “Adsorption Isotherm Measurements for Shales”  
San Francisco, California
- 2014 **Stanford Symposia of Undergraduate Research and Public Service.** Poster: “Sorption Isotherm Measurements to Determine Surface Area and Pore Volume for Shales”  
Stanford University, Stanford, California

## VOLUNTEER SERVICE

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### **Undergraduate Application Ambassador for Veterans of the United States Armed Forces**

Service2School.org, Stanford University, Stanford, California

January 2014 – August 2016

- Mentored 8 veterans of the United States Armed Forces through undergraduate college applications.
- Applicants were accepted to Stanford University; Rensselaer Polytechnic Institute; University of California - San Diego; University of California, Davis; and Williams College.

### **Radio Announcer and DJ**

Global Entrepreneurship Summit 2016, Stanford University, Stanford, California

June 2016

- Live radio coverage of President Obama as announcer for KZSU Stanford, 90.1 FM.

### **Marketing Research Team Volunteer**

Berkeley-Stanford Cleantech Conference, Stanford, California

Autumn 2011 – Spring 2012

## AWARDS

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**Bronze Star Medal** – United States Army. Awarded for mentoring Iraqi security forces.

Ramadi, Iraq

**City of Monterey Mayor’s Outstanding Leadership Award.** Presented by Mayor Della Salla.

Monterey, California

**Outstanding Speed Talk** - 2014 Symposia of Undergraduate Research and Public Service Poster.

Stanford University, Stanford, California

## **GRANTS**

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**McGee/Levorsen Graduate Research Grant, \$3000**

Stanford University, Stanford, California

**School of Earth Sciences Undergraduate Research Grant, \$7000**

Stanford University, Stanford, California

**Center for Global and Regional Environmental Research Grant, \$5000**

University of Iowa, Iowa City, Iowa

## **CERTIFICATES**

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**Stanford Ignite Full-time Session**, Graduate School of Business, Stanford University

**United States Army Instructor**, Fort Huachuca, Arizona

## **SKILLS**

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ModFlow, PFlow, PHREEQC, MINTEQ, Java, MATLAB, R, Microsoft Excel, Geochemist's Workbench,  
Various Audio Software, Athena Suite, and CrunchTope

Rubotherm High Pressure Adsorption, Quantachrome Autosorb iQ2, Carlo Erba C/N Analyzer, SSRL  
Badge, XRF, XRD, XAFS, XANES

## **LANGUAGES**

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Modern Standard Arabic

German