

Andres F. Clarens

Department of Engineering Systems and Environment
University of Virginia
Charlottesville, VA

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Education

Ph.D. Civil and Environmental Engineering and Natural Resources & Environment
University of Michigan, 2008

Dissertation: *Carbon Dioxide Based Metalworking Fluids*

Ph.D. advisors:

- Kim F. Hayes, Professor, Civil and Environmental Engineering
- Steven J. Skerlos, Professor, Mechanical Engineering
- Gregory A. Keoleian, Professor, Natural Resources and Environment

M.S.E. Environmental Engineering
University of Michigan, 2004

B.S. Chemical Engineering
University of Virginia, 1999

Thesis: *A Hybrid Approach to Phosphorus Modeling in Stratified Lakes*

Experience

Associate Director - University of Virginia Environmental Resilience Institute	September 2017-present
Associate Professor - University of Virginia Department of Civil and Environmental Engineering	August 2014-present
Visiting Professor – National Technical University, Argentina Environmental Engineering	February 2016- May 2016
Visiting Professor – Utrecht University, Netherlands Geosciences, Environmental Hydrogeology	August 2015- December 2015
Assistant Professor – University of Virginia Department of Civil and Environmental Engineering,	January 2008- August 2014
Graduate student research assistant – University of Michigan, Department of Civil and Environmental Engineering, Ann Arbor, MI.	September 2002- December 2007
Environmental Engineer – Tetra Tech, Inc., Fairfax, VA	October 2001-August 2002
Environmental Engineer – United States Peace Corps, Dominican Republic	July 1999-July 2001

Substantial Honors and Awards

- **United States Fulbright Fellow** – National Technical University of Argentina 2016
- **National Academies of Science, Arab American Frontiers of Science, Engineering and Medicine** - Participant 2014
- **National Science Foundation CAREER Award** 2013-2018

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- **Department Teaching Award** – UVa Civil and Environmental Engineering 2013
- **American Chemical Society Petroleum Research Fund Young Investigator Award** 2010-2012
- **Fund for Excellence in Science and Technology** – UVa Vice President for Research Office Junior Faculty Award (w/ L. Colosi) 2010-2011
- **University of Virginia Teaching Fellow** - One of six junior professors selected to develop teaching via yearlong program 2010-2011
- **Finalist and 1st runner up** - ConocoPhillips Penn State Energy Prize for game-changing technology in energy 2009
- **NASA/Virginia Space Grant Young Investigator Award** 2009
- **Distinguished Academic Achievement Award** - Given annually to one University of Michigan CEE Graduate Student 2007
- **1st Place Presentation** - Design and Manufacturing Session, Michigan Research Symposium 2006
- **3M Prize for Outstanding Achievement in Industrial Ecology** 2006
- **Outstanding Student Leader Award** - University of Michigan Annual Awards Program, Honorable Mention 2006
- **2nd Place, Student Poster Competition** - Association of Environmental Engineering and Science Professors Conference 2005
- **1st Place, Student Poster Competition** - International Society of Industrial Ecology Conference 2005
- **Leader 1st place team** - EPA People, Prosperity, and The Planet Design Competition 2005
- **1st Place Technical Paper Competition** - Society of Hispanic and Professional Engineers Conference 2005
- **EPA STAR Fellow** - Recipient of Graduate Fellowship 2004-2007
- **1st Place Presentation** - Design and Manufacturing Session, Michigan-KAIST Research Symposium 2004
- **Graduate Student Award in Environmental Chemistry** – American Chemical Society 2004
- **Spirit of Martin Luther King Award** - Given by the University of Michigan, College of Engineering 2004

Graduate students directed

Ph.D.

- **Shibo Wang**

Entered – Sept. 2007

M.S.E. – 2009

Qualifying Exam – May 2010

Proposal defense – Feb. 2012

Ph.D. defense – Jan. 2013: “*The role of interfacial phenomena in leakage from geologic carbon sequestration site*”

First job – Postdoctoral research fellow, Lawrence Berkeley National Laboratory

- **Eleazer Resurreccion** (co-advised with Lisa Colosi (CEE))

Entered – Sept. 2008

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MS defense – May 2010 “*Comparative Life Cycle Assessment of Algae Cultivation Methods*”

Qualifying Exam – Jan. 2011

Proposal defense – June 2012

Ph.D. defense – May 2013: “*Characterizing Synergisms between Algae-Mediated Wastewater Polishing and Energy Production*”

First job – McKnight Postdoctoral Fellow, University of Minnesota - Duluth

• Conrad ‘Alec’ Gosse

Entered – Sept. 2009

MS defense – May 2010: “*Incorporating Greenhouse Gas Emissions into Pavement Management Decisions*”

Qualifying Exam – Aug. 2010

Proposal defense – Feb. 2012

Ph.D. defense – October 2013: “*Environmentally Preferable Streets*”

First job – Commonwealth Computer Research

• Xiaowei Liu

Entered – Sept. 2008

Qualifying Exam – Jan. 2011

Proposal defense – July 2012

Ph.D. defense – May 2014: “*Climate Impacts of Next Generation Biofuels Produced from Algae*”

First job – Postdoctoral Research Scholar - Desert Research Institute (Univ. of Nevada System)

• Brian Weaver

Entered – Sept. 2009

Qualifying Exam – Jan. 2011

Proposal defense – Sept. 2012

Ph.D. defense – September 2014: “*Gas Expanded Lubricants*”

First job – Postdoctoral Research Fellow, ROMAC, MAE, Univ. of Virginia

• Zhiyuan Tao

Entered – Sept. 2012

Qualifying Exam – Jan. 2014

Proposal defense – April 2015

Ph.D. defense – April 2017: “*Storing and Securing Carbon Dioxide in Depleted Shale Formations*”

First job – Energy Analyst for Boston Consulting Group – Shanghai, PRC

• Rodney Wilkins

Entered – Sept. 2013

Qualifying Exam – Jan. 2015

Proposal defense – June 2017

Ph.D. defense – June 2018: “*Alternatives for Hydraulic Fracturing Fluids in Unconventional Shale Gas Wells*”

First job – Independent Consultant, Waynesboro, VA

• Bo Liang

Entered – Sept. 2011

Qualifying Exam – Jan. 2013

Proposal defense – Sept 2018

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Ph.D. defense – 2018: “The Role of Wettability, Surface Roughness, and Rock-Fluid Interactions on Multiphase Flow Dynamics in Geologic Carbon Storage”
First job – Schlumberger Energy Service, Houston, TX

- **Dan Plattenberger**

Entered – Sept. 2014

Qualifying Exam – Jan. 2015

- **Fangwei Cheng** (co-advised with Lisa Colosi (ESE))

Entered – Sept. 2016

- **Jay Fuhrman**

Entered – Sept. 2017

- **Jeff Bennett**

Entered – Sept. 2017

- **Jasmin Melara** (co-advised with Lisa Colosi (ESE))

Entered – Sept. 2017

MS

- **Mark Santana**

Beneficial Use of Coal Combustion Fly Ash: Evaluating the Environmental Implications

August 2009

Currently a Ph.D. student at the University of South Florida

Other MS students continued on to Ph.D. and are listed above.

MSE

- **Lyu Xiaotong**

Entered – Sept. 2013

Graduated – May 2018

Undergraduate student theses supervised

- **Coleman Goad**

Geospatial Analysis of CO₂ Fracturing and CO₂ Storage Potential in the Marcellus Shale

December 2018

- **Colin Kim**

Geospatial Analysis of CO₂ Fracturing and CO₂ Storage Potential in the Marcellus Shale

December 2018

- **Sarang Patel**

Pseudowollastonite Concrete

December 2018

- **Elie Seff**

Using Integrated Assessment Modeling to Compare Negative Emissions Technologies

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December 2018

Heena Shah

Geospatial Analysis of CO₂ Fracturing and CO₂ Storage Potential in the Marcellus Shale
December 2018

Tyler Brown

Using artificial intelligence to achieve deep reductions in power consumption at UVa
December 2017

Carly Cocke

Pseudowollastonite based cements
December 2017

Claire Trevasian

Improving the resilience and sustainability of the Puerto Rican Power sector using distributed generation
December 2017

Dustin Weir

Pseudowollastonite based cements
December 2017

Henry Cornell

Leapfrogging energy technology in the Argentinian Power Sector
December 2016

George Kohlroser

Nanostructured patterns on glass surfaces for manufacturing microfluidic devices
December 2016

Kendra Patrick

Wollastonite carbonation in glass bead columns
December 2016

Amy Linderman

Synthetic Rocks with Pore Structures
May 2014

Lauren Hunter

Fluid Flow Through 3-D Printed Porous Rocks
May 2014

Andrew Cole

Fluid Flow Through 3-D Printed Porous Rocks
May 2014

Nik McGruder (Chemical Engineering)

Experimental Study of Migration and Entrapment of CO₂ Leakage from Geologic Sequestration Sites
May 2014

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Stewart Walker

Properties of carbon dioxide bubble rise through porous geologic media, in environmental engineering

May 2013

Garrett Rapp

Measuring Buoyancy-Driven Subsurface CO₂ Behavior

May 2013

Ari Daniels

Bicycle route choice modeling: objectively predicting where cyclists will ride

May 2013

Kasey Harvey

Opportunities for Carbon Sequestration in Hydraulically Fractured Wells

May 2013

Ian Edwards

Wettability phenomena at the CO₂-brine-mineral interface: Implications for geologic carbon sequestration

May 2013

Adam Shepard

Metalworking Fluids Unit Process Life Cycle Inventory

May 2012

Zhuosong Wang

Gas-Expanded Lubricant Formation and Phase Behavior in Tilting-Pad Journal Bearings

May 2012

Brian Tison

Gas Expanded Lubricants

May 2011

Jasmine Copeland

Contact Angles Effects in Predicting Bubble Rise in Geologic Carbon Sequestration

May 2011

Matthew Shufflebarger

Red Mud Bricks Enhanced with Carbon Sequestration

May 2009

Visitors and postdoctoral fellows supervised

Postdoctoral Fellows:

Flo Liang

Ph.D. (2016) – Geology – Penn State University

September 2016 – 2018

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Pragnya Eranki

Ph.D. (2012) – Chemical Engineering – Michigan State University

February 2013 – February 2014

External research grants and contracts

Reinventing CEMENT: Carbonation-Enabled Mineralization to Engender Novel Technology Sponsor: Department of Energy ARPA-E Open PI: A. Clarens, co-PI: B. Opila, R. Shahsavari (Rice) Total Award Amount: \$1,318,828 Number of Person-months per year: 1	3/19-2/22
Characterizing the reactivity and industrial ecology of pseudowollastonite to enable high-performance building materials from waste streams Sponsor: National Science Foundation PI: A. Clarens Total Award Amount: \$300,000 Number of Person-months per year: 1	7/18-6/21
The Promise and Pitfalls of Negative Carbon Emissions – A Regional Case Study of the Chesapeake Bay Watershed Sponsor: 3 Cavaliers PI: A Clarens; Co-PIs: S. Doney, W. Shobe Total Award Amount: \$60,000 Number of Person-months per year: 0	1/19-12/19
Green to Grey Tradeoffs in Negative Emissions Technologies Sponsor: UVa Environmental Resilience Institute Collab PI: S. Doney; Co-PIs: A Clarens, W. Shobe Total Award Amount: \$30,000 Number of Person-months per year: 0	1/19-12/19
Rebuilding America's Infrastructure Sponsor: U.S. Department Of Education - Post Secondary Ed. PI: Lisa Colosi Peterson, co-PIs: Band, Clarens, Culver, Goodall, Lambert, Louis, Quinn, J. Smith Total Award Amount: \$348,840 Number of Person-months per year: 0	10/18-9/21
Pan-University Environmental Resilience Institute Sponsor: UVa Strategic Investment Fund PI: Karen McGlathery co-PI: A. Clarens Amount: \$2,000,000 No. of Students Supported: NA Academic year support: 1	9/16-8/19
GAANN: Resilient Infrastructure: Designing for America's Future	9/17-8/20

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Sponsor: U.S. Department of Education

PI: L. Colosi-Peterson co-PIs: A. Clarens, T. Culver, D. Chen, J. Goodall

Amount: \$600,000

No. of Students Supported: 1

Academic year support: 1

Engineering fractures and pores to selectively control fluid flow in porous media

7/16-7/17

Research Innovation Grants – UVa SEAS

Amount: \$76,000

No. of Students Supported: 1

Academic year support: 1

Targeted Mineral Carbonation to Enhance Wellbore Integrity

10/15-9/18

Sponsor: Department of Energy, National Energy Technology Laboratory

PI: A. Clarens, co-PI: Jeff Fitts (Princeton - CEE)

Amount: \$700,000

No. of Students Supported: 1 (+1 post-doc)

Academic year support: 1

Social and environmental implications of the shale gas boom on transportation systems: The Atlantic Coast Pipeline and its implications for Virginia and beyond

1/16-12/16

Sponsor: 4VA Grant Program

PI: A. Clarens, co-PI: Rider Foley (STS)

Amount: \$40,000

No. of Students Supported: 0.25

Academic year support: 0

UVa Resilience Fellows

1/16-12/16

Sponsor: Vice President for Research

PI: A. Clarens

Amount: \$10,000

No. of Students Supported: 0.25

Academic year support: 0

Anticipating the Environmental Impacts of Unconventional Fossil Fuel Development in Argentina

3/16-5/16

Sponsor: U.S. Fulbright Foundation

PI: A. Clarens

Amount: \$15,000

No. of Students Supported: 0

Academic year support: 2

Partnership to analyze multiphase transport in porous media with applications to carbon-neutral energy technologies (Supplement ERC-NSF CAREER Awards)

6/15-12/15

Sponsor: National Science Foundation

PI: A. Clarens

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Amount: \$15,000

No. of Students Supported: 0

Academic year support: 1

Biomass productivity technology advancement towards a commercially viable, integrated algal biomass production unit

10/13-9/15

Sponsor: Department of Energy

PI: C. Behnke (Sapphire Energy), co-PIs: J. Moreno, Y. Poon, B.

Saydah, S. Warner, D. Venardos, N. Baliga, L. Laurens, P. Savage, A.

Clarens, L. Colosi

Amount: \$5 M (UVa portion: \$50,000)

No. of Students Supported: 1

Academic year support: 0

Summer Support: 0 month

Improving transportation sustainability by mining existing data from traffic cameras

6/1/13-5/31/14

Sponsor: Jefferson Trust – Big Data Initiative

Co-PIs: A. Clarens and S. Acton

Amount: \$45,000 (AFC portion: \$20,000)

No. of Students Supported: 1

Academic year support: 0

Summer Support: 0 month

CAREER: Understanding the physicochemical and systems-level processes that would enable sustainable CO₂ sequestration in shales

6/1/13-5/31/18

Sponsor: National Science Foundation

PI: A. Clarens

Amount: \$414,392

No. of Students Supported: 1

Academic year support: 0

Summer Support: 1 month

Systems Analysis for the Bio-Jet Fuel Industry in Virginia

12/1/12-6/31/13

Sponsor: Virginia Center for Transportation Research and Innovation

PI: A. Clarens; co-PI: L. Colosi, J. Lambert

Amount: \$60,859 (AFC portion: \$40,000)

No. of Students Supported: 1

Academic year support: 0

Summer Support: 1 month

Nucleus: Redesign of Introduction to Green Engineering

6/1/13-5/30/14

Sponsor: UVA Teaching Resource Center

PI: A. Clarens

Amount of Award: \$10,000

Academic year support: 0

No. of Students Supported: 0

Summer Support: 1 month

Life cycle analysis in a carbon market context

2/1/13-1/31/14

Sponsor: Embori Group LLC

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PI: A. Clarens

Amount: \$33,038

No. of Students Supported: 1

Academic year support: 0

Summer Support: 0 month

Gas expanded lubricants: Energy efficiency and increased reliability
in power production using tunable fluids

6/1/13-5/31/14

Sponsor: Department of Commerce

PI: A. Clarens

Amount: \$40,000

No. of Students Supported: 1

Academic year support: 0

Summer Support: 0 month

Life cycle analysis of natural gas fired power production with carbon
capture and enhanced oil recovery

5/1/13-10/31/13

Sponsor: Bipartisan Policy Center

PI: A. Clarens

Amount: \$44,576

No. of Students Supported: 1

Academic year support: 0

Summer Support: 0 month

A Partnership for Multiscale Experimental Study of CO₂ Leakage and
Vertical Flow in Geologic Carbon Sequestration

10/1/11-9/31/14

Sponsor: National Science Foundation

PI: A. Clarens

Amount: \$446,062

No. of Students Supported: 1

Academic year support: 0

Summer Support: 1 month

GRDS: Characterizing Estrogenicity in Life Cycle Assessment
(Supplement)

9/1/12-8/31/13

Sponsor: National Science Foundation

PI: L. Colosi; co-PI: A. Clarens.

Amount: \$40,000

No. of Students Supported: 1

Academic year support: 0

Summer Support: 0 month

Conceptual Model for Conducting Climate Change Vulnerability and
Risk Assessments of Transportation Infrastructure Hampton Roads,
Virginia Implementation Pilot

10/1/10-9/31/11

Sponsor: Federal Highway Administration

PI: B. Smith, co-PIs: A. Clarens, J. Lambert, Y. Haimes, K. Hill, S.
Chase. AFC took lead preparing proposal and is co-directing this
grant with J. Lambert.

Amount: \$300,000 (AFC portion: \$60,000)

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No. of Students Supported: 1
Academic year support: 0
Summer Support: 1 month

A Meta-Model for Life Cycle Assessment of Algae-to-Energy Systems 9/31/11-8/31/13

Sponsor: National Science Foundation
PI: L. Colosi; co-PIs: A. Clarens, M. White. AFC, MAW, and LMC contribute equally to this work.
Amount: \$205,299 (AFC portion: \$60,000)
No. of Students Supported: 1
Academic year support: 0
Summer Support: 1 month

Gas Expanded Lubricants – Improving Energy Efficiency Using ‘Smart’ Fluids 9/1/10-8/31/12

Sponsor: American Chemical Society – Petroleum Research Fund
PI: A. Clarens
Amount: \$100,000
No. of Students Supported: 1
Academic year support: 0
Summer Support: 1 month

Gas Expanded Lubricants: Improving Wind Turbine Efficiency 6/1/10-8/30/10

Sponsor: Rodman Scholars
PI: B. Tison (undergraduate working in our group)
Amount: \$3,000
No. of Students Supported: 0
Academic year support: 0
Summer Support: 0

Estrogen uptake by algae cultivated using municipal wastewater for simultaneous bioremediation and energy production 6/1/10-5/29/11

Sponsor: UVA Vice President for Research and Graduate Studies: Fund for Excellence in Science and Technology
co-PI's: Andres Clarens and Lisa Colosi. AFC and LMC contribute equally to this work.
Amount: \$50,000 (AFC portion: \$25,000)
No. of Students Supported: 1
Academic year support: 0
Summer Support: 0

Gas Expanded Lubricants: Smart Fluids for Improving Efficiency of Wind Turbines 6/1/10-5/29/13

Sponsor: National Science Foundation
PI: A. Clarens, co-PI: P. Allaire. AFC directing this work with support from students in ROMAC laboratory.
Amount of Award: \$300,000 (AFC portion: \$282,000)
No. of Students Supported: 1
Academic year support: 0
Summer Support: 1.5 months

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Feasibility of Gas Expanded Lubricants: Improving Turbine Efficiency using 'Smart' Fluids Sponsor: ConocoPhillips and Penn State Energy Prize PI: A. Clarens Amount of Award: \$75,000 No. of Students Supported: 1 Academic year support: 0 Summer Support: 0 month	12/1/09-11/29/11
Gas-Expanded Lubricants: Improving Turbine Efficiency Using 'Smart' Fluids Sponsor: Virginia Space Grant Consortium - NASA PI: A. Clarens Amount of Award: \$10,000 No. of Students Supported: 1 Academic year support: 0 Summer Support: 0	7/1/09-6/30/10
Redesign of Introduction to Environmental Engineering to Focus on Environmental Sustainability Sponsor: UVA Teaching Resource Center – University Teaching Fellows PI: A. Clarens Amount of Award: \$6,000 Academic year support: 0 No. of Students Supported: 0 Summer Support: 1 month	6/1/10-5/30/11
CO ₂ sequestration with concurrent synthesis of fatty acid based fuels in a model organism: <i>Chlorella protothecoides</i> Sponsor: UVA Collaborative Energy Research Program PI: A. Clarens, co-PIs: L. Colosi, and M. White. AFC, MAW, and LMC contribute equally to this work. Amount: \$37,999 (AFC portion: \$15,000) No. of Students Supported: 1 Academic year support: 0 Summer Support: 0	6/1/08-5/31/09

Bibliography¹

Peer-reviewed journal publications

[49] Plattenberger, D. A., Ling, F. T., Tao, Z., Peters, C. A., & Clarens, A. F.* (2018). Calcium Silicate Crystal Structure Impacts Reactivity with CO₂ and Precipitate Chemistry. *Environmental Science & Technology Letters*, 5(9), 558-563. Citations = 0/0², IF = 5.308.

¹ Corresponding author indicated by *; students underlined

² Citations in: google scholar/ISI Web of Science

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- [48] Bielicki, J. M.* , Langenfeld, J. K., Tao, Z., Middleton, R. S., Menefee, A. H., & Clarens, A. F. (2018). The geospatial and economic viability of CO₂ storage in hydrocarbon depleted fractured shale formations. *International Journal of Greenhouse Gas Control*, 75, 8-23. Citations = 1/0 , IF = 4.078.
- [47] Liang, B., & Clarens, A. F.* (2017). Interactions Between Stratigraphy and Interfacial Properties on Flow and Trapping in Geologic Carbon Storage. *Water Resources Research*. Citations = 1/0 , IF = 4.397.
- [46] Barekati-Goudarzi, M., Muley, P. D., Clarens, A., Nde, D. B., & Boldor, D.* (2017). Continuous microwave-assisted in-situ transesterification of lipids in seeds of invasive Chinese tallow trees (*Triadica sebifera* L.): Kinetic and thermodynamic studies. *Biomass and Bioenergy*, 107, 353-360. Citations = 4/3 , IF = 3.22.
- [45] Botto, J., Fuchs, S. J., Fouke, B. W., Clarens, A. F., Freiburg, J. T., Berger, P. M., & Werth, C.J.* (2017). Effects of Mineral Surface Properties on Supercritical CO₂ Wettability in a Siliciclastic Reservoir. *Energy & Fuels*. Citations = 8/4 , IF = 2.84.
- [44] Clarens, A.F.* , C.A. Peters_(2016). "Mitigating Climate Change at the Carbon Water Nexus: A Call to Action for the Environmental Engineering Community." *Environmental Engineering Science* 33.10 (2016): 719-724. Citations = 3/3, IF = 1.48.
- [43] Wilkins, R.F., A.H. Menefee, A.F. Clarens* (2016). "Environmental life cycle analysis of water and CO₂-based fracturing fluids used in unconventional gas production." *Environmental Science & Technology*, 50.23: 13134-13141. Citations = 8/7 , IF = 5.33.
- [42] Abotalib, Mohammad*, Fu Zhao, and Andres Clarens. (2016) "Deployment of a Geographical Information System Life Cycle Assessment Integrated Framework for Exploring the Opportunities and Challenges of Enhanced Oil Recovery Using Industrial CO₂ Supply in the United States." *ACS Sustainable Chemistry & Engineering*. 4.9 (2016): 4743-4751. Citations = 4/3 , IF = 5.27.
- [41] Tao, Zhiyuan, Jeffery P. Fitts, and Andres F. Clarens*. (2016) "Feasibility of Carbonation Reactions to Control Permeability in the Deep Subsurface." *Environmental Engineering Science*. 33.10 (2016): 778-790. Citations = 3/3 , IF = 1.48.
- [40] Weaver, Brian K.* , Jason A. Kaplan, Andres F. Clarens, and Alexandrina Untaroiu. (2016) "Transient Analysis of Gas-Expanded Lubrication and Rotordynamic Performance in a Centrifugal Compressor." *Journal of Engineering for Gas Turbines and Power* 138, no. 4 (2016): 042504. Citations = 3/1 , IF = 1.48.
- [39] Weaver, Brian K.* , Amir A. Younan, Timothy W. Dimond, Zhuosong Wang, Paul Allaire, and Andres F. Clarens. (2016) "Properties and Performance of Gas-Expanded Lubricants in Tilting Pad Journal Bearings." *Tribology & Lubrication Technology* 72, no. 2: 36. Citations = 0/0 , IF = 0.1.
- [38] Weaver, Brian K.*, J.A. Kaplan, A.F. Clarens, A. Untaroiu. (2016) "Transient Analysis of Gas-Expanded Lubrication and Rotordynamic Performance in a Centrifugal Compressor" *ASME - J. Eng. Gas Turbines Power*. 138 (4), 042504. doi: 10.1115/1.4031527. Citations = 1/0 IF = 1.1.

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- [37] Weaver, B.K.*, Y. Zhang, A.F. Clarens; A. Untaroiu. (2015) “Nonlinear Analysis of Rub Impact in a Three-Disk Rotor and Correction via Bearing and Lubricant Adjustment” ASME - J. Eng. Gas Turbines Power. 137 (9), 092504. doi: 10.1115/1.4029778. Citations = 8/2 IF = 1.1.
- [36] Weaver, B.K.*, T.W. Dimond; J.A. Kaplan; A. Untaroiu; A.F. Clarens. (2015) “Gas-Expanded Lubricant Performance and Effects on Rotor Stability in Turbomachinery” ASME - J. Eng. Gas Turbines Power. 137(7):072601-072601-11. doi: 10.1115/1.4028846. Citations = 4/0 IF = 1.1.
- [34] Connelly, E.B., Colosi, L.M., Clarens, A.F., & Lambert, J.H.* (2015). Risk Analysis of Biofuels Industry for Aviation with Scenario-Based Expert Elicitation. Systems Engineering. 18 (2), 178-191. Citations = 23/2, IF = 0.96.
- [34] Connelly, E.B., Colosi, L.M.* , Clarens, A.F., & Lambert, J.H. (2015) “Life cycle assessment of biofuels from algae hydrothermal liquefaction: The upstream and downstream factors affecting regulatory compliance” Energy & Fuels 29 (3), 1653-1661 doi: 10.1021/ef502100f. Citations = 25/17 IF = 2.84.
- [33] Middleton, R. S., Clarens*, A. F., Liu, X., Bielicki, J. M., Levine, J. S. (2014). “CO₂ Deserts: Implications of Existing CO₂ Supply Limitations for Carbon Management” Environmental science & technology (19), 11713-11720. Citations = 29/12, IF = 5.33.
- [32] You, H., Connelly, E. B., Lambert, J. H.* , & Clarens, A. F. (2014). “Climate and other scenarios disrupt priorities in several management perspectives” *Environment Systems and Decisions*, 34(4), 540-554. Citations = 15/8, IF = NA.
- [31] Gosse, C.A.*, and A.F. Clarens (2014). “Estimating Spatially and Temporally Continuous Bicycle Volumes by Using Sparse Data” Transportation Research Record: Journal of the Transportation Research Board, Volume 2443. Urban and Traffic Data Systems 2014, Vol. 2, 115-122. DOI: 10.3141/2443-13. Citations = 17/7, IF = 0.566.
- [30] Wu, Y. J.* , Hayat, T., Clarens, A., & Smith, B. L. (2013). “Climate Change Effects on Transportation Infrastructure” *Transportation Research Record: Journal of the Transportation Research Board*, 2375(1), 71-81. Citations = 15/11, IF = 0.566.
- [29] Wang, S., Z. Tao, S. M. Persily, A. F. Clarens* (2013) “CO₂ adhesion on hydrated mineral surfaces” *Environmental Science and Technology*. 47 (20), pp 11858–11865. Citations = 24/22, IF = 5.33.
- [28] Tao, Z. and A. F. Clarens* (2013) “Estimating the carbon sequestration capacity of shale formations using methane production rates” *Environmental Science and Technology*. 47 (19), pp 11318–11325. Citations = 57/46, IF = 5.33.
- [27] Liu, X., B. Saydah, P. Eranki, L. M. Colosi, B.G. Mitchell, J. Rhodes, A. F. Clarens* (2013) “Pilot-scale data provide enhanced estimates of the life cycle energy and emissions profile of algae biofuels produced via hydrothermal liquefaction” *Bioresource Technology*. 148, 163-171. 9 pages. Citations = 155/100; IF = 4.75.
- [26] Haapala, K. R.* , F. Zhao, J. Camelio, J. W. Sutherland, S. J. Skerlos, D. A. Dornfeld, I. S. Jawahir, A. F. Clarens, J. L. Rickli. (2013) “A Review of Engineering Research in Sustainable Manufacturing” *ASME - Journal of Manufacturing Science and Engineering* 135, no. 4. 16 pages. Citations = 214/88; IF = 0.79.

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Peer-reviewed conference proceedings

- C[13] Bennett, J., Melara, J., Colosi, L., Clarena A.* (2018). Life cycle analysis of power cycle configurations in bioenergy with carbon capture and storage. *CIRP Procedia*
- C[12] Langenfeld, J. K., Bielicki, J. M., Tao, Z., Middleton, R. S., Menefee, A. H., & Clarens, A. F. (2017). Response of Integrated CO₂ Capture and Storage Systems in Saline Aquifers and Fractured Shale Formations to Changes in CO₂ Capture Costs. *Energy Procedia*, 114, 4099-4105.
- C[11] Clarens, A.F.*, T. Zhiyuan (2014) "Physicochemical factors impacting CO₂ sequestration in depleted shale formations: The case of the Utica shale." *Energy Procedia*. October 2014. Austin, Texas. pp. 5153-5163. 10.1016/j.egypro.2014.11.545
- C[10] Bielicki, J.M., A.F. Clarens*, R.S. Middleton, X. Liu, J.S. Levine, M.B. de Carvalho, Nelson Giovanini Junior. (2014) "Shifting Sands in a CO₂ Desert: Replacing Extracted CO₂ with Byproduct CO₂ for Use in Enhanced Oil Recovery" *Energy Procedia*. October 2014. Austin, Texas. pp. 6557-6564. 10.1016/j.egypro.2014.11.692
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- C[8] Wu, Y.*, T. Hayat, A. F. Clarens, B. L. Smith (2013) "Scenario-based Climate Change Risk Analysis for Transportation Infrastructure using GIS" *Transportation Research Board*. 13-1832.
- C[7] Gosse, C. A., A. F. Clarens* (2012) " Pareto-Optimal Network Asset Management: A Pavement Case Study" *International Symposium on Life Cycle Assessment and Construction*. July 2012. Nantes, France.
- C[6] Wang, S., A. F. Clarens* (2012) "Improved Force Balance for Predicting Vertical Migration of CO₂ from Geologic Sequestration Sites" *CMTC-151748-PP. Carbon Management and Technology Conference*. February 2012. Orlando, Florida.
- C[5] Haapala, K. R.*, F. Zhao, J. Camelio, J. W. Sutherland, S. J. Skerlos, D. A. Dornfeld, I.S. Jawahir, H.C. Zhang, and A.F. Clarens. "A review of engineering research in sustainable manufacturing." In *Proceedings of the ASME 2011 International Manufacturing Science and Engineering Conference*, pp. 599-619. 2011.
- C[4] Clarens, A. F.*, Y. E. Park, J. Temme, K. F. Hayes, F. Zhao, S. J. Skerlos (2009), "Evaluation of Cooling Potential and Tool Life in Turning Using Metalworking Fluids Delivered in Supercritical Carbon Dioxide". *Proceedings of the 2009 ASME International Manufacturing Science and Engineering Conference*. October 2009. West Lafayette, Indiana.
- C[3] Clarens, A. F.*, D. J. MacLean, K. F. Hayes, S. J. Skerlos. (2009) "Solubility of a Metalworking Lubricant in High Pressure CO₂ and Effects in Three Machining Processes", *Proceedings of the North American Manufacturing Research Conference (NAMRC 2009)*. Clemson University, May 2009.
- C[2] Zhao, F. , A. F. Clarens, K. F. Hayes, S.J. Skerlos* (2007), "Evaluating Activation Conditions for Extreme Pressure Additives in Metalworking Fluids Using the Thread Forming Test".

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C[1] Clarens, A. F., J. B. Zimmerman, H. R. Landis, K. F. Hayes, S. J. Skerlos* (2004) "Experimental Comparison of Vegetable and Petroleum Base Oils in Metalworking Fluids Using the Tapping Torque Test." Presented at the Proceedings of Japan-USA Symposium on Flexible Automation. July 2004, Denver, CO.

Peer-reviewed government reports

- Rhodes, J.; A.F. Clarens; P. Eranki; C.S. Long. (2015) "Electricity from Natural Gas with CO₂ Capture for Enhanced Oil Recovery" California Council on Science and Technology. January 2015
- Skole et al. (2015) America's Future: Environmental Research and Education for a Thriving Century. A 10 year outlook. Report of the National Science Foundation Advisory Committee for Environmental Research and Education (AC-ERE). July 2015

Book Chapters

Clarens, A. F., Colosi, L.M. "Life cycle assessment of algae-to-energy systems" Peer-reviewed, invited chapter Advanced Biofuels & Bioproducts. Springer. Ed. James Lee. October 2010.

Miscellaneous not-reviewed publications

- Wang, S. and Clarens, A. F.* (2010), "Feasibility of Gas-Expanded Lubricants for Increasing Energy Efficiency in Power Turbines," Preprint Paper-American Chemical Society, Division of Fuel Chemistry, 55 (1)
- Clarens, A. F.*, Colosi, L. M. "Putting algae's promise into perspective" Invited editorial. Biofuels. November 2010.
- Clarens, A. F.*, E. P. Resurreccion, M. A. White, L. M. Colosi (2010) "Response to Comment on: Environmental Life Cycle Comparison of Algae to Other Bioenergy Feedstocks" Environmental Science and Technology. 44 (9), 3643-3643
- Clarens, A. F.*, E. P. Resurreccion, M. A. White, L. M. Colosi (2011) "Response to Comment on: Environmental Life Cycle Comparison of Algae to Other Bioenergy Feedstocks" Environmental Science and Technology. 45 (2), 834-834

Journal publications under review

- Bennett, J., J. Fuhrman, T. Brown, N. Andrews, R. Fittro, A. Clarens "Feasibility of Using sCO₂ Turbines to Balance Load in Power Grids with a High Deployment of Solar Generatin." Submitted to Energy. October 2018
- Wilkins, R., B. Liang, M. Plampin, A. Clarens "The Impacts of Interfacial Properties on Fluid Fate and Transport in Shale Gas Development." Submitted to Energy and Fuels. January 2019
- Liang, B., I.M. Zarikos, W.B. Bartels, S.M. Hassanizadeh, A. Clarens "The effect of nanoscale surface textures on multiphase flow dynamics in capillaries." Submitted to Langmuir. January 2019

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- Plattenberger¹, D.A., F.T. Ling, C.A. Peters, and A.F. Clarens. “Targeted Permeability Control in the Subsurface Via Calcium Silicate Carbonation” Submitted to Environmental Science and Technology. February 2019

Conference presentations

- “The impact of interfacial properties on fluid fate and transport during production of hydraulically fractured unconventional gas wells” American Geophysical Union Fall Meeting, Washington, DC. 12/18
- “Machine learning application for mapping calcium mineral precipitates using coupled microscale XRF and XRD” (Given by Catherine Peters) American Geophysical Union Fall Meeting, Washington, DC. 12/18
- “Integration of supercritical CO₂-power cycles to improve grid resilience and sustainability” International Conference on the Management of Energy, Climate and Air for a Sustainable Society, Havana, Cuba. 7/18
- “Novel bio-organoclay composites designed to seal leaking well-bores” Interpore Annual Meeting, New Orleans, LA. 5/19
- “Pseudowollastonite carbonation could enable new frontiers in carbon storage” American Geophysical Union Fall Meeting, New Orleans, LA. 12/17
- “Targeted Mineral Carbonation to Enhance Wellbore Integrity” Mastering the Subsurface Through Technology, Innovation and Collaboration. Pittsburgh, PA 8/17
- “Life Cycle Implications of Using CO₂-Based Fracturing Fluids as a Substitute for Slickwater” Carbon Management Technology Conference. Houston, TX 7/17
- “Using Peer-Instruction Strategies in Environmental Engineering Education” Association of Environmental Engineering and Science Professors Meeting. Ann Arbor, MI 6/17
- “Targeted permeability control in the subsurface for emerging energy applications” Association of Environmental Engineering and Science Professors Meeting. Ann Arbor, MI 6/17
- “Use of functionalized nanoparticles to selectively control permeability in porous media” Interpore Annual Meeting. Rotterdam, NL. 5/17
- “Targeted Mineral Carbonation to Enhance Wellbore Integrity” Mastering the Subsurface Through Technology, Innovation and Collaboration: Carbon Storage and Oil and Natural Gas Technologies Review Meeting. 8/16
- “Targeted Control of Subsurface Permeability Using Mineral Carbonation Reactions” Goldschmidt Annual Meeting. Prague, Czech Republic. 8/15
- “Carbonation of wollastonite in shale formations” Interpore Annual Meeting. Padua, Italy. 5/15
- “Carbonation of wollastonite in a shale matrix” Association of Environmental Engineering and Science Professors Meeting. New Haven, CT 6/15

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- “Feasibility of using depleted shales as a repository for permanent storage of CO₂” American Geophysical Union Fall Meeting. San Francisco, CA 12/13
- “Adhesion of CO₂ on Hydrated Mineral Surfaces and Its Implications to Geologic Carbon Sequestration (GCS)” American Geophysical Union Fall Meeting. San Francisco, CA 12/13
- “Pilot-scale data provide enhanced estimates of the life cycle energy and emissions profile of algae biofuels produced via hydrothermal liquefaction” Pacific Rim Summit on Industrial Biotechnology & Bioenergy. San Diego, CA 12/13
- “An integrated experimental program to understand leakage from geologic carbon sequestration sites across scales” Association of Environmental Engineering and Science Professors. Golden, CO 7/13
- “Historical land use change emissions: Implications for biofuel accounting” International Symposium on Sustainable Systems and Technology. Cincinnati, OH 5/13
- “Feasibility of using depleted shales as a repository for permanent storage of CO₂” Technical and Community Challenges of Hydraulic Fracturing for Shale Gas. Boulder, CO 8/13
- “An integrated experimental program to understand leakage from geologic carbon sequestration sites across scales” American Geophysical Union Fall Meeting. San Francisco, CA 12/12
- “An integrated experimental program to understand leakage from geologic carbon sequestration sites” ACS - Northeast Regional Meeting. Rochester, NY 10/12
- “Integrating environmental life cycle assessment into infrastructure design and management” ASCE - Workshop on Sustainability Quantification for Building and Infrastructure Design, Engineering and Construction. Ft. Worth, TX 10/12
- “CO₂-Brine Rheology Could Suppress Leakage From Geologic Carbon Sequestration Sites” (Given by Shibo Wang). American Geophysical Union Fall Meeting. San Francisco, CA 12/11
- “Meta-model of Algae Bio-Energy Life Cycles (MABEL)” (Given by Xiaowei Liu) American Center for Life Cycle Assessment Meeting. Chicago, IL. 10/11.
- “Comparative Life Cycle Assessment and Costing of Algae Cultivation Methods” (Given by Eleazer Resurreccion) American Center for Life Cycle Assessment Meeting. Chicago, IL. 10/11.
- “Life cycle impacts of winter maintenance treatments for roadways” American Center for Life Cycle Assessment Meeting. Chicago, IL. 10/11.
- “The top five things that environmental engineers can teach us about algae-to-energy technology” Association of Environmental Engineering and Science Professors Meeting. University of South Florida. 7/11
- “Safe and effective geologic sequestration of CO₂: Multi-scale experimental studies of formation integrity and leakage” Association of Environmental Engineering and Science Professors Meeting. University of South Florida. 7/11
- “Life cycle assessment of algae-to-energy technologies. International Society for Industrial Ecology” University of California, Berkeley 6/11

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- “Evaluating the environmental impact of algae cultivation techniques using life cycle assessment” American Center for Life Cycle Assessment Meeting. Portland, OR. 11/10
- “Feasibility of gas-expanded lubricants for increased energy efficiency in rotating machinery” ASME/STLE International Joint Tribology Conference. San Francisco, CA. 10/10
- “Modeling metalworking fluid penetration in the cutting zone to understand EAL” ASME/STLE International Joint Tribology Conference. San Francisco, CA. 10/10
- “Gas expanded lubricants for increased energy efficiency in power turbines” American Chemical Society National Meeting. San Francisco, CA. 3/10
- “Rheology of CO₂-H₂O mixtures: Implications for understanding leakage in geologic sequestration” American Chemical Society National Meeting. San Francisco, CA. 3/10
- “Identifying the Rate Limiting Steps in Sustainable Algae Production for Bioenergy” American Chemical Society National Meeting. San Francisco, CA. 3/10
- “What can algae farmers learn from environmental engineers?” Association of Environmental Engineering and Science Professors Meeting. University of Iowa. 7/09

Conference posters

- “Comparative Life-Cycle Assessment of Aquatic and Terrestrial Bioenergy with CO₂ Capture and Storage” (Given by J. Melara) American Geophysical Union Fall Meeting. Washington, DC 12/18
- “Calcium silicate crystal structure impacts its reactivity with CO₂ and chemistry of reaction products” (Given by D. Plattenberger) American Geophysical Union Fall Meeting. Washington, DC 12/18
- “Bio-organoclay composite materials designed to seal leaking and abandoned natural gas well-bores” (Given by F. Chen) American Geophysical Union Fall Meeting. Washington, DC 12/18
- “Interfacial Impacts on Slickwater Imbibition and Gas Production in the Marcellus Shale” Interpore. New Orleans, LA 5/18
- “Cementing pores and fractures using mineral silicate carbonation in situ” Interpore. New Orleans, LA 5/18
- “Harnessing mineral carbonation reactions to seal fractured shales and sequester carbon” (Given by Tao Zhiyuan) American Geophysical Union Fall Meeting. San Francisco, CA 12/14
- “Estimating the CO₂ sequestration capacity of fractured shale formations using methane production rates: The case of the Utica Shale” (Given by Tao Zhiyuan) American Geophysical Union Fall Meeting. San Francisco, CA 12/14
- “Adhesion of CO₂ on hydrated mineral surfaces and its implications to geologic carbon sequestration” Gordon Research Conference – Flow and Transport in Permeable Media. Lewiston, ME

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- “Experimental study of heterogeneity-induced capillary trapping in the context of leakage from geologic carbon sequestration sites” (Given by Bo Liang) American Geophysical Union Fall Meeting. San Francisco, CA 12/14
- “Adhesion at the CO₂/mineral interface” Association of Environmental Engineering and Science Professors. Golden, CO 7/13
- “A novel method for quantifying the greenhouse gas emissions of biofuels based on historical land use change” American Geophysical Union Fall Meeting. San Francisco, CA 12/12
- “Evaluating the role of interfacial properties on controlling buoyancy driven leakage from geologic carbon sequestration sites” Gordon Research Conference on Flow Through Porous Media. Les Diablerets, Switzerland 7/12
- “Methodological shortcomings of life cycle assessment when evaluating emerging energy technologies: The case of algae” Gordon Research Conference on Industrial Ecology. Les Diablerets, Switzerland 7/12
- “Evaluating the role of interfacial properties on controlling buoyancy driven leakage from geologic carbon sequestration sites” NSF – CBET Grantees Meeting. Baltimore MD 6/12
- “Wetting phenomenon of representative minerals in geologic carbon sequestration formations” (Presented by Shibo Wang) 2012 Carbon Capture and Sequestration Meeting. Pittsburgh, PA. 5/12
- “Improved Force Balance For Predicting Vertical Migration of CO₂ from Geologic Sequestration Sites” Carbon Management Technology. Orlando, FL 2/12
- “The wettability of CO₂ on minerals under relevant geologic carbon sequestration conditions and its implications on leakage processes” American Geophysical Union Fall Meeting. San Francisco, CA 12/11
- “Greenhouse Gas Emissions in Pavement Management Systems” American Center for Life Cycle Assessment Meeting. Portland, OR. 11/10
- “Rheology of CO₂-saturated brine solutions: Implications for fluid flow under geologic-storage relevant conditions” 2010 Carbon Capture and Sequestration Meeting. Pittsburgh, PA. 5/10
- “Greenhouse Gas Emissions Associated with Large-Scale Algae Cultivation” 2010 Carbon Capture and Sequestration Meeting. Pittsburgh, PA. 5/10

Invited talks

- “The Energy-Water Nexus and Hydraulic Fracturing: Toward a waterless and carbon neutral future” United States Geological Survey Seminar Series, Reston, VA 4/13/17
- “Targeted control of permeability using carbonate dissolution/precipitation reactions” American Geophysical Union – Fall Meeting, San Francisco, CA 12/12/16
- “Thinking about the ‘engineering’ in ‘geoengineering’” NC – State CEE Department Seminar 11/18/16

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- “CO₂ - shale interactions with implications for fracturing, enhanced gas production, and storage” FEST Seminar Series – Utrecht University, 12/8/15
- “CO₂/shale interactions and their implications for fracturing, enhanced gas production, and storage” Chemical Engineering Seminar, Imperial College London 10/20/15
- “CO₂/shale interactions” Pore Scale Physics Seminar, Royal Dutch Shell, 11/3/15
- “Are hydraulically fractured shales viable repositories for carbon storage?” Purdue University, Environmental and Ecological Engineering, 4/29/15
- “Could hydraulically fractured shale formations be used as repositories for carbon storage?” Frontiers of Geoscience Colloquia, Los Alamos National Lab - Earth and Environmental Sciences Division, 3/9/15
- “Calculating the carbon sequestration capacity of fractured shale formations” – National Energy Technology Laboratory, Department of Energy, 7/22/14
- “Feasibility of using depleted shales as a repository for permanent storage of CO₂” – Princeton – Civil and Environmental Engineering Seminar. Princeton, NJ 4/14/14
- “Climate implications of algae-based bioenergy systems” – American Chemical Society Green Chemistry and Engineering Conference. Bethesda, MD 6/20/13
- “Climate implications of algae-based bioenergy systems” – Cornell University – Civil and Environmental Engineering Seminar. Ithaca, NY 9/20/12
- “Are wastewater treatment plants the next Saudi Arabia?” – Virginia Tech - Environmental and Water Resources Seminar. Blacksburg, VA 4/13/12
- “Limits to Algae Biofuels” – MITRE Corporation – Workshop on Next Generation Energy Technologies 3/28/12
- “Multi-scale experimental studies of CO₂ vertical migration from geologic sequestration sites” – NSF – Sustainable Engineering and Education for Sustainability Workshop, Minneapolis, MN 10/20/11
- “Multi-scale experimental studies of CO₂ vertical migration from geologic sequestration sites” – University of Virginia, Department of Chemical Engineering, Charlottesville, VA 9/15/11
- “Life cycle assessment of algae-to-energy technologies” – National Academies of Engineering – Committee on Sustainable Development of Algal Biofuels, Washington, DC 6/13/11
- “The top five things that life cycle assessment can teach us about algae-to-energy technology” – Scripps Oceanographic Institute – Algal biotechnology seminar series. San Diego, CA 11/3/10
- “Why soils matter for biofuels” – Life cycle evaluation of algae-to-energy - Soil Science Society National Meeting, Long Beach, CA 11/2/10
- “Understanding vertical migration of CO₂ under geologic storage conditions” – University of Virginia, Department of Environmental Sciences Seminar, Charlottesville, VA 9/16/10
- “Identifying the rate limiting steps in bioenergy production from algae” – Carnegie Mellon University, Department of Civil and Environmental Engineering Seminar, Pittsburgh, PA 5/11/10
- “Horizons in alternative energy” – Presented to the Axel Johnson Board of Directors. (\$3 billion privately owned company) Portsmouth, NH 10/6/09

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Patents

- Novel Method to Dispose of Carbon, Stabilize Fractured Shale Formations
United States Patent Disclosure (12/12/14)
Inventors: Clarens, A. F., T. Zhiyuan, J. Fitts.
- Gas-expanded lubricants
United States Patent (1/23/18)
Inventors: Clarens, A. F., P.E. Allaire, A. Younin, S. Wang.
- Metalworking Fluids Delivered in Supercritical Carbon Dioxide
United States Patent (4/17/08)
Inventors: Clarens, A. F.; S.J. Skerlos; K.F. Hayes

Professional service

- **Appointed Member** – Advisory Committee (to the Director of NSF) for Environmental Research and Education of the US National Science Foundation. Serving a 3-year appointment (2014-2017). Appointment extended for an additional two years (2017-2019)
- **Member** – SEAS Working Group on Design of the Common Core 2019
- **Search Committee** – Engineering Systems and Environment Search (3 Positions) 2017-18
- **Appointed Member** – Advisory Committee (AdCom to the Associate Director of NSF for Engineering) for the Engineering Directorate of the US National Science Foundation. Serving a 3-year appointment (2013-2016).
- **Assistant Chair for Graduate Studies** - Civil and Environmental Engineering (1/2014 – 5/15)
- **Search Committee** – Dean, School of Engineering and Applied Science, UVA
- **Search Committee** – Environmental Sciences, UVA, Position in Atmospheric Science
- **Faculty advisor** – Engineering Students Without Borders (2010 – 2013)
- **Member** – Committee on Research Distinctiveness, School of Engineering and Applied Science Strategic Planning 2010-2011
- **Member** – President’s Committee on Sustainability – School and Department Initiatives Subcommittee (2011 – present)
- **Assistant Chair for Graduate Studies** (interim Fall 2009) - SEAS Graduate Studies Committee
- **Co-chair** – Hoos for Haiti Benefit Concert which raised over \$30,000 for disaster relief and rebuilding in Port-au-Prince, Haiti following the massive earthquake (January 2010).
- **Chair for CEE** – SEAS Open House Committee (2008-2011)
- **Facilitator** – SEAS First-Year Common Reading Experience (2009, 2010, 2011, 2012, 2013).
- **Member** – CEE Web-Site Committee (2011)
- **Member** – CEE Space Committee (2011)
- **Member** – University Committee on Fraternities & Sororities (2010)
- **Journal Reviewer** (and number of manuscripts reviewed) – Accounts of Chemical Research (2), Algae Research (1), American Society of Agricultural and Biological Engineers (1), Applied Energy (3), ASME – Journal of Energy Resources Technology (1), Biofuels (1), Bioresource Technology (13), Chemosphere (1), Colloids and Surfaces A: Physicochemical and Engineering Aspects (1), Energies (1), Energy (2), Energy & Fuels (4), Energy Conversion and Management (1), Energy Policy (1), Environmental Engineering Science (6), Environmental Research Letters (7), Environmental Science and Technology (48), Environmental Science and Technology Letters (5), Environmental Science: Processes & Impacts (1), EOS (1), Frontiers (2), Fuel (5), Fuel Processing Technology (1), Global Change Biology (1), Geomechanics and Geophysics for

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Geoenergy and Georesources (1), Greenhouse Gases Science and Technology (3), Industrial and Engineering Chemistry Research (4), International Journal of CO₂ Utilization (2), International Journal of Energy and Environmental Engineering (1), International Journal of Greenhouse Gas Control (4), Joule (1), Journal of Cleaner Production (3), Journal of Energy Resources Technology (1), Journal of Engineering Manufacture (1), Journal of Green Building (1), Journal of Industrial Ecology (5), Journal of Infrastructure Systems (3), Journal of Manufacturing Systems (1), Journal of Manufacturing Processes (2), Journal of Transportation Engineering (1), Journal of Water and Climate Change (2), Langmuir (1), Materials Research (1), Nature Energy (1), Philosophical Transactions A (1), PNAS (1), SPE Journal (1), Water Resources Research (3), Water Science and Technology (2)

- **Proposal Reviewer** (and number of proposals reviewed) – National Science Foundation (89), Environmental Protection Agency (54), Department of Agriculture (18), Department of Energy (17).
- **Session Organizer and Chair**
 - **The geochemistry of carbon storage and sequestration** at Goldschmidt Annual Meeting, Prague, Czech Republic, 8/15
 - **New adventures in reactive flow through porous media** at Association of Environmental Engineering and Science Professors 2013 Meeting, Golden, CO 7/13
 - **Modeling Sustainable Systems** at International Symposium on Sustainable Systems and Technology, Cincinnati OH 4/13
 - **Exploring the Multiple Scales of Leakage from Geologic Carbon Sequestration Sites** at American Geophysical Union, International Fall Meeting, San Francisco, CA 12/11
 - **Environmentally Sustainable Manufacturing Processes and Systems** at International Conference on Manufacturing Science and Engineering, ASME, West Lafayette, IN 10/09

Professional Associations

American Chemical Society	2002 - present
International Society of Industrial Ecology	2005 - present
American Association of Environmental Engineering and Science Professors	2005 - present
American Geophysical Union	2010 - present

Foreign Languages

Native Spanish speaker

Interests

- Running
- Swimming
- Brewing
- Outdoor sports - backpacking and fly fishing
- Travel