JOE FRANK BOZEMAN III
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EDUCATION

Ph.D. in Environmental Engineering: Sustainability	University of Illinois at Chicago	(2019)
Master of Science in Engineering: Renewable and Clean Energy	Wright State University	(2010)
Bachelor of Science in Mechanical Engineering	Wright State University	(2008)

RESEARCH

University of Illinois at Chicago (Advisor: Dr. Thomas L. Theis)
Researcher for the Institute of Environmental Science and Policy
08/2016-Present
Ways to Increase Marketability and Reduce Food-Energy-Water Impacts in Urban and Peri-Urban Farming

Urban and peri-urban farmers in the Chicago Consolidated Metropolitan Statistical Area (CMSA) – in the state of Illinois - experience several barriers including lack of agriculture-inclusive ordinances, overly-specific zoning regulations, land access issues, lack of funding, inadequate farmer training and certification, water access issues, and insurance issues. CMSA farming has impacts on U.S. natural resources. In that, agricultural practices and the U.S. food system are estimated to use 50% of total U.S. land, 80% of fresh water resources, and 17% of its fossil energy. Food, energy, and water (FEW) use challenges are likely to intensify with population growth and food consumption demands. Urban and peri-urban agriculture could utilize FEW resources more efficiently than more traditional farming practices through conversion or urban wastes into resources, mutually-beneficial land use, and improved water use efficiencies. Furthermore, urban and peri-urban agriculture is becoming more valued due to increasing challenges regarding food security and human health. Recent studies involving urban agriculture and policy reforms in other countries – such as in India, China, and New Zealand – have shown that urban and peri-urban farming regulatory reforms can yield beneficial outcomes for people, prosperity, and the environment. However, previous studies have not provided CMSA researchers and farmers tools that indicate how the implementation of certain policy and various ecosystem factors affect urban and peri-urban agricultural activities. This study explores how the implementation of certain policy factors (e.g., agriculture-inclusive ordinances, improved land access, and improved water access) and various ecosystem factors (e.g., safety issues and market factors) affect overall urban and peri-urban agricultural effectiveness and FEW resources over time through probabilistic modeling. This exploration will lead to the development of a framework that will facilitate policy solutions for reducing CMSA urban and peri-urban regulatory barriers as well as indicate how FEW resources are impacted.

Key Skills: Sustainability, Food-Energy-Water (FEW) Nexus, Life Cycle Assessment, Machine Learning, Neural Network Modeling, Python Coding, Agent-Based Modeling, Netlogo Coding, Policy Development, Food Systems, Research & Development

U.S. Department of Veterans Affairs & Department of Defense
Researcher & Developer for the Veterans Health Administration
03/2011-06/2013
The Cold Composting Calculator

Cold Composting is the process of naturally replenishing soil fertility through the proper mowing and storage of grass, twigs and leaves. The Cold Composting Calculator was developed to assist in waste-diversion data collection efforts since United States federal energy & environmental sustainability officers are mandated to perform such tasks. Research and mathematical data compilations, utilizing sources from the likes of the U.S. Environmental Protection Agency and National Oceanic and Atmospheric Administration, resulted in a developed tool that estimates the amount of cold compost yielded per acre, for any location in the U.S. The Cold Composting Calculator has been effective nation-wide and for numerous federal agencies, including the Department of Veteran Affairs.

Key Skills: Sustainability, Environmental Engineering, Research & Development, Program/Project Management

Wright State University (Advisor: Dr. Hong Huang)
Research/Teaching Assistant
05/2008-06/2010
Sulfur-Tolerant Catalysts for the Solid Oxide Fuel Cell

JP-8 fuel is easily accessible, transportable, and has hydrogen content essential to solid oxide fuel cell (SOFC) operation. However, JP-8 fuel has sulfur content that can form poisonous hydrogen sulfide. This syngas degrades electrochemical activity and causes complete SOFC failure in some cases. In effort to mitigate this degradation, sulfur-tolerant catalysts supported on cerium oxide were cost-effectively synthesized and computationally analyzed. Specifically, catalyst compounds were synthesized using the low-cost sol-gel method; the material compounds were analyzed and verified using X-Ray Diffractometry and Scan Electron Microscopy; and sulfur-tolerance was analyzed using supercomputing techniques (i.e., Gaussian software) to administer quantum mechanical algorithms that simulated molecular motion and reactivity. Experimental syntheses of copper, platinum, and platinum-copper skin catalysts supported on cerium oxide were ultimately verified. The platinum-copper skin catalyst was determined to be the most cost-effective, sulfur-resistant catalyst.

Key Skills: Renewable & Clean Energy, Materials Synthesis, X-Ray Diffractometry, Scan Electron Microscopy, Supercomputing, Gaussian, Electrochemical System Analysis, Research & Development

Wright State University (Advisors: Dr. Joseph C. Slater and Dr. Ruby P. Mawasha)
Senior Design Project Team Leader
06/2007-08/2008
Triangular Truss Deployment in a Near Space Environment

Introducing large-scale structures into space is limited by the size of the transport vehicle, assembly time, and labor intensity among other limitations. Therefore, investigations of methods to optimize each aforementioned factor are essential to enhanced in-space operations. One such method was the development of a large-scale, lightweight truss structure that could be stowed a fraction of its deployed size and deployed using minimal resources. An unfolding triangular truss structure was developed utilizing shape memory polymer composite material. This structure was successfully deployed in a near space environment. The attained results were intended to bolster Defense Advanced Research Projects Agency research for potential military surveillance purposes.

Key Skills: Mechanical Engineering, Thermal Conductivity, Leadership, Materials Analysis, Research & Development, Project Management

PUBLICATIONS

Bozeman III, J.F. & Watson, R. (2012). The Cold Composting Calculator: A Novel Tool. *Internally Published Oct 2012. VHA Center for Engineering & Occupational Safety and Health (CEOSH)*.
Impact: Nationwide
Reach: Interagency (i.e., VA, DoD, and EPA)

Bozeman III, J.F. & Huang, H. (2011). Structural Characteristics of Bimetallic Catalysts Supported on Nano-Ceria. *Journal of Nanomaterials*. Article ID 329757, pp. 1-6. http://dx.doi.org/10.1155/2011/329757.
Impact Factor: 1.871

Bozeman, J., Marruffo, A., Barney, I., Jackson, A., Mukhopadhyay, S., & Huang, H. (2011). Synthesis and Characteristics of Nano-ceria Supported Bimetallic Catalysts for S-tolerant SOFCs. *ECS Transactions*. Vol. 35, No. 1, pp. 1689-1696.
https://corescholar.libraries.wright.edu/cgi/viewcontent.cgi?article=1059&context=mme.
Reach: Proceeding

Bozeman, J. (2010). SULFUR-TOLERANT CATALYST FOR THE SOLID OXIDE FUEL CELL. (Electronic Thesis or Dissertation). *Retrieved from https://etd.ohiolink.edu/. https://etd.ohiolink.edu/pg_10?0::NO:10:P10_ETD_SUBID:85931*.
Downloads: 1,000+
Reach: Open Access

PRESENTATIONS

2018 University of Illinois at Chicago Student Research Forum – Poster on the demographics of food-energy-water (FEW) impacts as they relate to U.S. food commodity consumption
04/2018

Midwestern Association of Graduate Schools – Presented on food-energy-water (FEW) impacts as they relate to U.S. dietary intake and food insecurity (3-Minute-Thesis Regional Competition Finalist)
04/2018

BarnRaise 2017 – Presented on and designed a food system that alleviates food insecurity in urban environments
10/2017

2017 Joint Conference: International Society for Industrial Ecology – International Symposium on Sustainable Systems and Technology – Poster on food desert emergence as it relates to energy and environmental sustainability
06/2017

Low Carbon Earth Summit – Qingdao, China – Presented on U.S. Interagency Sustainability
09/2014

Environmental Sustainability and Innovation at VA – Presented on the Cold Composting Calculator
07/2013

Region 5 Federal Green Challenge Symposium – Presented on sustainability program and cold composting
06/2013

2011 GreenGov Symposium – Presented on development of the Cold Composting Calculator
11/2011

University Clean Energy Alliance of Ohio - Presented on sulfur-tolerant catalyst of the solid oxide fuel cell
04/2010

Dayton Engineering Science Symposium – Presented on sulfur tolerance of the solid oxide fuel cell
10/2009

Ohio Aerospace Institute – Presented on high altitude balloon apparatus
09/2009

University Clean Energy Alliance of Ohio – Presented on thesis approach regarding the solid oxide fuel cell
04/2009

National Science Foundation – Presented on triangular truss system and thermal conductivity of Shape Memory Polymer
06/2008

GRANT ACTIVITY

National Science Foundation – Advancing Careers in Academics with Diversity Education and Mentorship in Engineering
For 06/2018

Purpose:	Enhance skills for a successful academic career
Type:	External
Role:	Primary writer (i.e., teaching philosophy, research statement, CV, mini lesson plan)
Status:	Accepted

University of Illinois at Chicago
08/2016-Present
Research: Food-Energy-Water (FEW) Impacts as they relate to Dietary Intake and Food Insecurity
Type: Internal
Role: Member of research team

Ohio Space Grant Consortium
05/2008-06/2010
Research: Sulfur-Tolerant Catalysts for the Solid Oxide Fuel Cell
Type: External
Role: Member of research team

Wright State University
05/2008-06/2010
Research: Sulfur-Tolerant Catalysts for the Solid Oxide Fuel Cell
Type: Internal
Role: Member of research team

Defense Advances Research Projects Agency
06/2007-08/2008
Research: Triangular Truss Deployment in a Near Space Environment
Type: External
Role: Member of research team

Wright State University
06/2007-08/2008
Research: Triangular Truss Deployment in a Near Space Environment
Type: Internal
Role: Member of research team

TEACHING

U.S. Department of Veterans Affairs
04/2016
Subject: Life Cycle Cost Analysis
Type: One-segment course
Mode: In-person
Audience: Program Managers from across the nation

U.S. Department of Veterans Affairs
04/2016
Subject: Understanding Energy and Energy Calculations
Type: One-segment course
Mode: In-person
Audience: Program Managers from across the nation

U.S. Department of Veterans Affairs
02/2016
Subject: Project Engineering and Green Environmental Management System Programming
Type: One-segment course
Mode: In-person
Audience: Program Managers from across the nation

U.S. Department of Veterans Affairs
12/2015
Subject: The Green Environmental Management System – Energy Connection
Type: One-segment course
Mode: Online
Audience: Program Managers from across the nation

Wright State University
01/2010-04/2010
Course: Finite Element Analysis Lab
Type: Quarter-length course
Mode: In-person
Audience: Undergraduates

Wright State University
08/2009-11/2009
Course: Mechanical Vibrations Lab
Type: Quarter-length course
Mode: In-person
Audience: Undergraduates

Wright State University
02/17/2009
Course: Fundamental Engineering Exam Review Class: Statics
Type: Single class
Mode: In-person
Audience: Undergraduates

Central State University
01/2009-04/2009
Courses: Physics, Statics, and Dynamics
Type: Tutor
Mode: In-person
Audience: Undergraduates

EMPLOYMENT HISTORY

U.S. Department of Veterans Affairs, North Chicago, IL
Green Environmental Management System (GEMS) Program Manager
08/2011-Present
- Chairs the GEMS Committee which implements energy and environmental sustainability programming such as energy/environmental auditing & inspections, hazardous waste, air permitting, and recycling among others
- Oversees and executes programmatic budget
- Helps facility to avoid negative public relation outcomes and thousands of dollars in monetary fines
- Drafts interagency agreements and facilitates conflict resolution at local, regional, and national levels
- Writes and develops local and national-level policies, guidebooks, strategic plans, and directives
- Maintains facility compliance with EPA, OSHA, NRC, and other federal regulatory entities & federal mandates

Key Skills: Strategic Planning, Sustainability, Program/Project Management, Directive/Policy Writing, Environmental Compliance, Budgeting, Excellent Communication, Healthcare

U.S. Department of Veterans Affairs, Dayton, OH
GEMS Coordinator
07/2010-08/2011
- Managed and helped to implement energy and environmental sustainability programming
- Maintained facility compliance with EPA, OSHA and other federal regulatory entities

Key Skills: Sustainability, Program/Project Management, Environmental Compliance, Healthcare

Wright State University, Dayton, OH
Chief of Staff (Student Government)
08/2009-06/2010
- Supervised and managed the student government body
- Served as Chair of the Health Care Committee and participated on other university-wide committees

- ❖ Authored collegiate health care language that eventually became university policy and Ohio state law

Key Skills: Supervisorial Tact, Strategic Planning, Legislative Writing, Program/Project Management, Healthcare, Formal Governmental Procedure, Budgeting

Wright State University, Dayton, OH
Deans Student Advisory Board of Computer Engineering and Computer Science Chair
01/2009-03/2009

- ❖ Provided an organizational platform and appointed members representing each pertinent college
- ❖ Facilitated communication between the Dean of CECS and the student body

Key Skills: Supervisorial Tact, Strategic Planning

United Parcel Service (UPS), Sharonville, OH
Plant Engineer/ Part Time Supervisor
09/2006-06/2008

- ❖ Supervised 20+ employees for conveyor maintenance, drive maintenance, and porter related tasks
- ❖ Oversaw monthly budget and record keeping expenditures for projects and functional billing
- ❖ Prepared management reports, organized & led meetings, and maintained business partner relationships

Key Skills: Supervisorial Tact, Project Management, Budgeting

SERVICE

Joint Conference: International Society for Industrial Ecology – International Symposium on Sustainable Systems and Technology
06/2017

Type: Academic
Level: International
Role: Session manager and volunteer

Journal of Renewable and Sustainable Energy
2017-Present

Type: Academic
Level: International
Role: Peer reviewer (3)

Centers for Companies That Care
02/2012-07/2015

Type: Non-Profit
Level: City (Chicago, IL)
Role: STEM career representative and mentor

Department of Defense Educational Activity
04/2012

Type: U.S. Government
Level: National
Role: STEM Representative at Marine Corp Base Camp Lejeune

Wright Leadership Education to Advance Development
07/2008 & 07/2014

Type: Academic
Level: International (Durban, South Africa)
Role: Volunteer

PROFESSIONAL LEADERSHIP

EEAB – Energy-GEMS sole representative for GEMSAG at U.S. Department of Veterans Affairs
02/2012-Present

Type:	U.S. Government
Level:	National
Role:	GEMSAG member

GEMS Committee
08/2011-Present

Type:	U.S. Government
Level:	National
Role:	Member

GEMSAG – Chair
01/2015-03/2016

Type:	U.S. Government
Level:	National
Role:	Chair

Chicago Interagency Sustainability Council
09/2014-07/2015

Type:	U.S. Government
Level:	Regional
Role:	Chair

Intergovernmental Affairs Committee
07/2013-07/2015

Type:	U.S. Government
Level:	Regional
Role:	Member

Chicago Interagency Sustainability Council
06/2013-07/2014

Type:	U.S. Government
Level:	Regional
Role:	Member

CERTIFICATIONS

Certified Energy Manager (CEM)
10/2013-Present

Federal Acquisition Certification for Program/Project Managers (FAC-P/PM)
10/2012-Present

Contracting Officer's Representative (COR/COTR)
11/2011-Present

Engineer-in-Training (EIT)
05/2011-Present

AWARDS

Carl Storm Underrepresented Minority Fellowship – 2018 Industrial Ecology Gordon Research Conference
3-Minute-Thesis (3MT) Winner: 1st Place – 2018 University of Illinois at Chicago
Dr. Martin Luther King, Jr. Scholarship – 2017 – 2018 University of Illinois at Chicago
Green Partner for Change Award – 2017 Practice Greenhealth Environmental Excellence Awards
Tuition Support for Sustainability Ph.D. – 2017 U.S. Department of Veterans Affairs

Green Partner Recognition Award – 2016 Practice Greenhealth Environmental Excellence Awards
Young Energy Professional of the Year Award: Region III – 2015 The Association of Energy Engineers
Green Partner for Change Award – 2015 Practice Greenhealth Environmental Excellence Awards
Regional Education and Outreach Award – 2015 Environmental Protection Agency Federal Green Challenge
Regional Transportation Award - 2014 Environmental Protection Agency Federal Green Challenge
National Transportation Award - 2013 Environmental Protection Agency Federal Green Challenge
Regional Overall Achievement Award – 2013 Environmental Protection Agency Federal Green Challenge
Regional Innovation Award - 2013 Environmental Protection Agency Federal Green Challenge
Legend in Energy - 2012 Association of Energy Engineers
Excellence: Certificate of Appreciation - 2012 Department of Defense Education Activity STEM Activity
Member of the Quarter – Fall Quarter 2009 Wright State University's Student Government
OSEA Certificate of Achievement – 2008 Glenn Stokes Summer Research Internship Program; NSF conference
Dean Honorable Mention – High Altitude Balloon Team (Senior Design Project)
Best Student Paper Award – Won award for technical paper and presentation; 2008 ASEE NCSC
OSEA Certificate of Achievement – 2007 Glenn Stokes Summer Research Internship Program; NSF conference
2004 Student Athlete Achievement for Outstanding Grade Point Average

AFFILIATIONS

Association of Environmental Engineering and Science Professors (AEESP)
12/2017-Present
Type: Academic/ U.S. Government
Level: International
Role: Member

American Planning Association (APA)
12/2017-Present
Type: Academic/ U.S. Government
Level: National
Role: Member

International Society for Industrial Ecology (ISIE)
11/2017-Present
Type: Academic/U.S. Government
Level: International
Role: Member

Association of Energy Engineers (AEE)
01/2012-Present
Type: Academic/U.S. Government
Level: National
Role: Member (illiana, IL Chapter)

TRAINING

Survey Experiments
11/08/2017

Social Desirability in Survey Research
11/01/2017

Life Cycle Cost Estimating Course
12/2014

FEMP 19 Fundamentals of Life Cycle Costing for Energy Conservation
06/2014

Intermediate Green Environmental Management Systems
09/2013

Certified Energy Auditor Training
04/2013

Storage Tank Operator Training: Illinois Class A/B/C
04/2013

Underground Storage Tank Operator Training: A/B/C
04/2013

OSHA 30-Hour Construction Safety Training
02/2013

Certified Energy Manager for Energy Managers
01/2012

Contracting Officer's Representative
11/2011

ISO14001 Lead Auditor Training
08/2011

Basic Green Environmental Management Systems
04/2011

Basic Safety, Industrial Hygiene, Environmental, Emergency Management and Fire Protection
02/2011

How to Develop and Deliver Dynamic Presentations
01/2011

Environmental Technical Career Field
09/2010

Problem Solving and Decision Making
08/2010

Critical Thinking
08/2010

Oral and Written Communication
08/2010

REFERENCES

Dr. Thomas L. Theis
Director, Institute for Environmental Science and Policy
University of Illinois at Chicago
Relation: Ph.D. Advisor

Dr. Sybil Derrible
Associate Professor, Civil and Materials Engineering
University of Illinois at Chicago
Relation: Ph.D. Committee Member

Dr. Hong Huang
Associate Professor, Mechanical & Materials Engineering
Wright State University
Relation: Master's Advisor

Dr. Ruby P. Mawasha
Research Professor, College of Science and Engineering
Central State University
Relation: Research Advisor