

# Caitlyn S. Butler

ASSOCIATE PROFESSOR

☎ (413) 545-5396 | ✉ csbutler@umass.edu | 🏠 blogs.umass.edu/csbutler | 🐦 @CButlerLab

## Education

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### University of Notre Dame

Notre Dame, IN

PH.D., ENVIRONMENTAL ENGINEERING

January 2010

**Dissertation**, *Fundamental and Applied Studies of Microbial Fuel Cells for Sustainable Water and Wastewater Treatment*,  
Adviser: R. Nerenberg, Ph.D.

### Smith College

Northampton, MA

B.S., ENGINEERING SCIENCE

May 2004

**Honors Thesis**, *Mechanistic Study of the Oxidation of H-terminated Silicon(100)*,  
Adviser: K.T. Queeney, Ph.D.

## Professional Experience

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### Associate Professor

September 2018 - PRESENT

CIVIL AND ENVIRONMENTAL ENGINEERING, UNIVERSITY OF MASSACHUSETTS, AMHERST

Amherst, MA

*Research Interests*: My research objectives focus on developing energy-efficient treatment strategies for both water and wastewater treatment. I study biofilm systems where microorganisms use counter-diffusional chemical gradients to accomplish treatment goals. I am interested in developing scalable process designs that could be easily integrated into existing treatment infrastructure, but am also interested in the ecology and function of the microorganisms that facilitate treatment. In addition to my technical research objectives, I am also interested in developing and assessing the effectiveness of educational techniques and strategies to improve engineering education.

### Assistant Professor

September 2011 - August 2018

CIVIL AND ENVIRONMENTAL ENGINEERING, UNIVERSITY OF MASSACHUSETTS, AMHERST

Amherst, MA

### Assistant Professor

January 2010 - May 2011

DEPARTMENT OF ENGINEERING, THE POLYTECHNIC SCHOOL, ARIZONA STATE UNIVERSITY

Mesa, AZ

### Graduate Faculty

January 2010 - May 2011

SCHOOL OF SUSTAINABILITY AND THE BUILT ENVIRONMENT, ARIZONA STATE UNIVERSITY

Mesa, AZ

### Graduate Research Assistant

September 2004 - December 2009

CIVIL, ENVIRONMENTAL AND EARTH SCIENCES, UNIVERSITY OF NOTRE DAME

Notre Dame, IN

*Research Topics*: *Microbial Fuel Cells (MFCs)*, *Microbial Ecology*, *Scalable MFC Reactor Design Using Hollow Fiber Membranes and Biocathodes for Denitrification and Perchlorate Reduction*, Adviser: R. Nerenberg, Ph.D.

### Graduate Teaching Assistant

September 2004 - May 2007

CIVIL, ENVIRONMENTAL AND EARTH SCIENCES, UNIVERSITY OF NOTRE DAME

Notre Dame, IN

*Courses*: *Introduction to Chemical Engineering*, *Introduction to Environmental Engineering*, *Hazardous Waste Management*, *Civil Engineering Materials*, and *Environmental Microbiology*

### Undergraduate Research Assistant

September 2001 - May 2004

DEPARTMENT OF CHEMISTRY & PICKER ENGINEERING PROGRAM, SMITH COLLEGE

Amherst, MA

*Research Topic*: *Mechanistic Study of the Oxidation of H-terminated Silicon and Protein Adsorption to Silicon Surfaces*, Adviser: K. Queeney, Ph.D.  
*Research Topic*: *Impedance of the Human Ear Canal*, Adviser: S. Voss, Ph.D.

### Undergraduate Research Assistant

September 2004 - May 2007

DEPARTMENT OF PHYSICS & PICKER ENGINEERING PROGRAM, SMITH COLLEGE

Northampton, MA

*Courses*: *Fundamentals of Environmental Engineering*, *Mass and Energy Balances and Introduction to Physics*

### Vice-President of Distribution

1996 - 2004

"HEARS TO YOU": THE NATIONAL DISCOUNT BATTERY SERVICE

Northampton, MA

## Awards, Fellowships, and Honors

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<b>CEE Research Award</b> , awarded by the University of Massachusetts, Amherst Department of Civil and Environmental Engineering	2019
<b>Outstanding Teaching in Environmental Engineering and Science Award</b> , awarded by Association of Environmental Engineering and Science Professors	2019
<b>Barbara H. and Joseph I. Goldstein Outstanding Junior Faculty Award</b> , awarded by University of Massachusetts College of Engineering	2018
<b>Lilly Fellowship for Teaching Excellence</b> , awarded by University of Massachusetts Center for Teaching and Faculty Development	2017
<b>Student Centered Teaching and Learning Fellowship</b> , awarded by University of Massachusetts Center for Teaching and Faculty Development	2015
<b>National Science Foundation CAREER Award</b> , for five years of research support for the improved understanding of cross-kingdom biofilms	2015
<b>AfricaSan Research and Technological Innovation Award</b> , awarded by the African Ministers' Council on Water for the development and deployment of the Microbial Fuel Cell Latrine	2015
<b>Exceptional Merit Award</b> , award in recognition of professional accomplishments by the Office of the Provost, University of Massachusetts	2014
<b>ASCE ExCEED Fellowship</b> , a fellowship awarded to attend the ASCE Excellence in Civil Engineering Education (ExCEED) Teaching Workshop	2012
<b>NSF Environmental Molecular Science Institute Fellowship</b> , a research fellowship awarded internally by EMSI at the University of Notre Dame	2009
<b>Bayer Predoctoral Research Fellowship</b> , a research fellowship given by the Center for Environmental Science and Technology at the University of Notre Dame	2008
<b>Excellence in Teaching Award</b> , given by the Kaneb Center for Teaching and Learning at University of Notre Dame	2007
<b>Transatlantic Environmental Biotechnology Fellowship</b> , or travel to and work at the Laboratory for Microbial Ecology and Technology at Ghent University, Ghent, Belgium. Supported by EU-US Task Force on Biotechnology	2007
<b>Adeline Devor Penberthy Memorial Prize</b> , for excellence in engineering and leadership at Smith College	2004
<b>Picker Engineering Fellowship</b> , a four year undergraduate scholarship at Smith College	2000-2004

## Teaching Experience

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### University of Massachusetts

September 2011 - PRESENT

#### CIVIL AND ENVIRONMENTAL ENGINEERING

Amherst, MA

##### Courses:

- Introduction to Thermodynamics and Heat Transfer - CEE 250 - Spring 2018, Spring 2019
- Bioprocess Lab - CEE 697P - Fall 2016
- Environmental Engineering Microbiology - CEE 497B/573 - Fall 2015, Spring 2017, Spring 2019
- Biological Processes in Environmental Engineering - CEE 671 - Fall 2011, 2012, 2013, 2018, 2019
- Environmental and Water Resources Engineering Seminar - CEE 691/692 - Fall 2012, 2013, Spring 2017
- Introduction to Environmental and Water Resources Engineering - CEE 370 - Spring 2012, 2014, 2016, Fall 2014

### Arizona State University

January 2010 - May 2011

#### ENGINEERING, THE POLYTECHNIC SCHOOL

Mesa, AZ

##### Courses:

- Engineering Design - EGR 202 - Spring 2010, Spring 2011
- Civil Engineering Capstone - EGR 401/402
  - 2009-2010 - Civil Infrastructure Solutions in Ghana, Africa
  - 2010-2011 - Quagga Mussel Prevention at Desert Basin Power Generation Facility
- Environmental Engineering - EGR 494 - Fall 2010
- Material Selection - EGR 224 - Spring 2011

## Notable Professional Development and Achievements

**Innovate@UMass**, awarded a fellowship to participate in the inaugural symposium to provide faculty with hands-on training in latest instructional technologies while building a community of scholars who will contribute to a campus innovation think tank throughout the academic year. Amherst, MA, 2016

**NEWEA Community Award**, worked with Kathleen Shea of the Clarke Schools for Hearing and Speech to develop elementary engineering curriculum based in language develop and acquisition. This work was award a \$1000 grant from the New England Water Environment Association for the purchase of classroom science and engineering materials. 2015-2016

**Nominated for Distinguished Teaching Award**, University of Massachusetts, 2016-2017, 2018-2019

## Research Advising

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### Postdoctoral Scholars

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

**Cynthia Castro**, *Research Topic*: Microbial Ecology of Oxygenic Photogranules 2017-2018  
**Celina Dozier**, *Research Topic*: Pharmaceuticals in Urine Composts from Community Gardens 2016 - 2017  
**Cloelle S. Giddings**, *Research Topic*: Reactor Design for Microbial Electrosynthesis 2012-2013

### PhD Students

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

**Ian Graham**, *Research Topic*: Ecology and Diffusion of Oxygenic Photogranules 2019-present  
**Joann Rodriguez Suarez**, co-advised with Dr. Boris Lau, *Research Topic*: Nanoparticles and Polymer-crosslinking in Biofilms, *Student Accomplishments*: Northeast Alliance for Graduate Education and the Professoriate Fellowship, 2017, Ford Foundation Fellowship Honorable Mention, 2016, Berger Award, Awarded: 2017 2015-present  
**Cynthia Castro**, *Research Topic*: Microbial Dynamics in Large-scale Anodes, *Student Accomplishments*: National Science Foundation (NSF) Graduate Research Fellowship, Awarded: 2012, Texas AWWA Scholarship Awarded: 2012, NSF Graduate Research Opportunities Worldwide, Awarded: 2014, Perrell Fellowship, Awarded: 2017 2014-2017  
**Varun Srinivasan**, *Research Topic*: Microbial Competition in Electrode-Associated Biofilms, *Student Accomplishments*: Edward Sisson Fellowship, Awarded: 2013, Biofilm Summer School Fellowship, Awarded: 2014, Berger Award, Awarded: 2015 2012-2017

### Masters Students

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

**Bryan Ovelheiro**, co-advised with Simos Gerasimidis, *Research Topic*: 3D Printed Biofilm Supports for Wastewater Treatment 2019-present  
**Samuel Downes**, *Research Topic*: Oxygenic Photogranules under Periods of Stress, *Student Accomplishments*: First Place Poster, New England Graduate Student Water Symposium, 2018, Berger Award 2019 2017-2019  
**Megan Hann**, *Research Topic*: Mechanisms of formation and ecology of Oxygenic Photogranules 2016-2018  
**Kristie Stauch-White**, *Research Topic*: Microbial Ecology in Oxygenic Photogranules, *Student Accomplishments*: Boscov Fellowship, Awarded: 2014, National Science Foundation (NSF) Graduate Research Fellowship, Awarded: 2015, Noga Award, Awarded: 2016 2013-2016  
**Joshua Jack**, *Research Topic*: Methanogenesis in the MFC Latrines 2014-2015  
**Cynthia Castro**, *Research Topic*: Developing a Microbial Fuel Cell Latrine for Organics and Nitrogen Removal 2011-2014  
**Jacob Weinrich**, *Research Topic*: Bioelectrochemical Reduction of Oxidized Contaminants 2011-2013

## Visiting Students/Scholars

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

**Anbarasan Anbalagan**, Malaraden University, Sweden, *Research Topic*: Nitrogen Transformation in Phototrophic Bioreactors

2017

## Thesis and Dissertation Committee Member

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

**Ayushi Patel**, *Dissertation*: *In silico* Metabolic Design of Engineered Microbial Consortia for Biotechnology Applications, Chair: Michael Henson, Chemical Engineering

2019-present

**Abeera Ansari**, *Dissertation*: Investigating the Role of Iron in Oxygenic Photogranulation Phenomena Under Batch Cultivation Conditions, Chair: Chul Park

2018-present

**Gikonyo Joseph Gitau**, *Dissertation*: Scaling up the Oxygenic Photogranule Process, Chair: Chul Park

2018-present

**Zehui Xia**, *Dissertation*: The Effects of Solute Composition and Nanoparticle Surface Properties on Nano-Bio Interactions, Chair: Boris Lau

2017-2019

**Adam McNair**, *Thesis*: Pilot Reactor Operation of the Oxygenic Photogranules Wastewater Treatment Processes, Chair: Chul Park

2017

**Heonsop Eom**, *Dissertation*: Investigation of Bioavailability of Dissolved Organic Nitrogen (DON) Derived from Conventional Activated Sludge (CAS) and Biological Nutrient Removal (BNR) Processes

2015-2017

**Aaron Brennan**, *Thesis*: Investigating Pilot Scale Performance of an Activated Sludge Wastewater Treatment system with a High Rate Anaerobic Side Stream Reactor, Chair: Chul Park

2015

**Sarah Hensley**, *Dissertation*: Optimizing Bioremediation of Complex Organic Compounds using Hyperthermophiles Through the Determination of Factors Effecting Archaeal Fermentation Balance, Chair: Jim Holden, Microbiology

2011-2014

**Katie Fox**, *Thesis*: A Grounded Theory Analysis of the Green Latrine Sanitation Pilot Project Planning and Construction at the Nyakrom Secondary Technical School in Nyakrom, Ghana, Chair: Ellen Pader, Landscape Architecture and Regional Planning

2012-2014

**Precious Biyela**, *Dissertation*: Water Quality Decay and Pathogen Survival in Drinking Water Distribution, Chair: Bruce Rittmann, ASU, Biodesign Institute

2010

## Additional Graduate Mentoring

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

**UMass Innovation Challenge**, Team Green Latrine: Cynthia Castro and Joe Goodwill, Civil and Environmental Engineering Department, Katie Fox and Sally Miller, Landscape Architecture and Regional Planning Department. **Won** MinutePitch Competition, Awarded: \$1000, October 2012, **Runner-up** Executive Summary Competition, Awarded: \$1000, December 2012

## Undergraduate Mentoring

UNIVERSITY OF MASSACHUSETTS, CIVIL AND ENVIRONMENTAL ENGINEERING

<b>Isabella Cobble</b> , <i>Honors Thesis</i> : Short-chain fatty acid fed Microbial Fuel Cells, <i>Honors Research Grant</i> , \$1600	2017-2019
<b>Victoria Hennon</b> , <i>Research Topic</i> : Oxygenic Photogranules	2017-2019
<b>Fernanda Brena</b> , REU: Oxygenic Photogranules	Summer 2017 & 2018
<b>Christa Spedding, Bridgette Charlebois and Leighann D'Andrea</b> , <i>Research Topic</i> : Urine Composting at the Florence Community Garden	2016-2017
<b>Katelyn Evans</b> , <i>Research Topic</i> : Large-scale Microbial Fuel Cell Performance	2016-2018
<b>Davis Miller</b> , <i>Honors Thesis</i> : Nanoparticles and Biofilms, <i>Honors Research Grant</i> , \$1500,	2016-2017
<b>Dan Clasby</b> , <i>Research Topic</i> : SCFA Profiles in Fermented Biosolids	2015-2017
<b>Gilson Hogan</b> , <i>Research Topic</i> : Cultivation of OPGs	2015-2016
<b>Carly Prystac</b> , <i>Research Topic</i> : Biochar Microbial Fuel Cells	2013-2014
<b>Timothy Ma</b> , <i>Research Topic</i> : MFC Pilot Latrine	2012-2013

## Peer-Reviewed Journal Articles

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\* indicates graduate students and postdocs

1. Kuo-Dahab, W.C., Stauch-White, K., **Butler, C.S.**, Gikonyo, G., Carbajal-González, B., Ivanova, A., Dolan, S., and Park, C., Investigation of the fate and dynamics of extracellular polymeric substances (EPS) during sludge-based photogranulation under hydrostatic conditions, *Environmental Science Technology*, Accepted, DOI: 10.1021/acs.est.8b0303
2. Abouhend, A., McNair, A., Kuo-Dahab, W., Watt, C., **Butler, C.S.**, Milferstedt, K., Hamelin, J., Seo, J., Gikonyo, G., El-Moselhy, K. Park, C. The oxygenic photogranule process for aeration-free wastewater treatment., *Environmental Science Technology*
3. Milferstedt, K., Kuo-Dahab, W.C.\* , **Butler, C.S.**, Hamelin, J., Abouhend, A.S., Stauch-White, K\*, McNair, A., Watt, C., Carbajal-González, B.I., Dolan, S., and Park, C. The importance of filamentous cyanobacteria in the development of oxygenic photogranules. *Scientific Reports* Vol. 7, No. 17944., 2017
4. Stauch-White, K\*, Srinivasan, V\*, Kuo-Dahab, W.C.\*, Park, C., **Butler, C.S.**, The role of inorganic nitrogen in successful formation of granular biofilms for wastewater treatment that support cyanobacteria and bacteria, *AMB Express*, Vol 7, No. 146, 2017
5. Srinivasan, V\* and **Butler, C.S.**, Ecological and Transcriptional Responses of Anode-Respiring Communities to Nitrate in a Microbial Fuel Cell, *Environmental, Science and Technology*, Vol. 51, No. 9, 5334-5342, 2017
6. Castro, C\*, Srinivasan, V\*, Jack, J\*, and **Butler, C.S.**, Decentralized wastewater treatment using a bioelectrochemical system to produce methane and electricity, *IWA Water Sanitation and Hygiene*, Vol. 6, No 4, 613-621, 2016
7. **Butler, C.S.** and Lovley, D., How to Sustainably Feed a Microbe: Strategies for Biological Production of Carbon-Based Commodities with Renewable Electricity, *Frontiers in Microbiology*, Vol. 7, No. 1879, 2016,
8. Lau, B. and **Butler, C.S.**, Censored at the Nanoscale, *Frontiers in Microbiology*, Vol. 7, No. 253, 2016
9. Srinivasan, V\*, Weinrich, J\*, **Butler, C.S.**, Nitrite-Accumulation in a Denitrifying Biocathode, *Environmental Science: Water Research and Technology* Vol. 2, 344 - 352, 2016
10. Giddings, C. S. G.\* , Nevin, K. P., Woodward, T., Lovley, D.R., **Butler, C.S.**, Simplifying Microbial Electrosynthesis Reactor Design, *Frontiers in Microbiology*, Vol. 6, No. 468, 2015
11. Castro, C.J\*, Goodwill, J.E\*, Rogers, B., Henderson, M., **Butler, C.S.**, Deployment of the Microbial Fuel Cell Latrine in Ghana for Decentralized Sanitation, *IWA Water Sanitation and Hygiene*, Vol. 4, No. 4, 2014
12. Gedalanga, P., Kotay, S.M, Sales, C.S., **Butler, C.S.**, Goel, R., Mahendra, S., Novel Applications of Molecular Biological and Microscopic Tools in Environmental Engineering, *Water Environment Research*, Vol. 85, No. 10, 2013
13. Mahendra, S., Gedalanga, P., Kotay, S. M., Torres, C. I., **Butler, C.S.**, and Goel, R., Advancements in Molecular Techniques and Applications in Environmental Engineering: A Review, *Water Environment Research*, Vol. 84 No. 10, 2012
14. Goel, R., Kotay, S.M., **Butler, C.S.**, Torres, C.I., and Mahendra, S., Molecular Biological Methods in Environmental Engineering, *Water Environment Research*, Vol. 83, No. 10, 2011
15. **Butler, C.**, Clauwaert, P., Green, S., Verstraete, W., Nerenberg, R., Bioelectrochemical Perchlorate Reduction in a Microbial Fuel Cell, *Environmental Science and Technology*, Vol. 44, No. 12, 2010
16. **Butler, C.** and Nerenberg, R., Microbial Fuel Cell Performance and Microbial Ecology as a function of Air-Cathode Materials, *Applied Microbiology and Biotechnology*, Vol. 86, No. 5, 2010
17. Clauwaert, P., Desloover, J., **Shea, C.**, Nerenberg, R., Boon, N., Verstraete, W. Enhanced Nitrogen Removal in Bio-Electrochemical Systems by pH control, *Biotechnology Letters* Vol. 31, No 6, 2009

18. Kulkarni, M., Green, S. K., **Shea, C.**, and Queeney, K. T., The Role of Etching in Aqueous Oxidation of Hydrogen-Terminated Si(100), *Journal of Physical Chemistry C*, Vol. 113, No. 23, 2009
19. **Shea, C.**, Clauwaert, P., Verstraete, W., Nerenberg, R., Adapting a Denitrifying Biocathode for Perchlorate Reduction, *Water, Science and Technology*, Vol 58, No 10, 2008
20. Seders, L., **Shea, C.**, Lemmon, M., Maurice, P., Talley J., LakeNet: An Integrated Sensor Network for Environmental Sensing in Lakes. *Environmental Engineering and Science*, Vol. 24, No. 2, 2007
21. Voss S., Horton N., Woodbury R., **Shea, C.**, Smith A., Sources of variability in Reflectance Measurements on Normal Human Ears. Huber A. and Eiber A., editor. *Proceedings of the 4TH International Symposium on Middle Ear Mechanics in Research and Otology*; 2006 27-30, Zurich, Switzerland. World Scientific; 2007. p. 78-86.

## Book Chapters and Commentaries

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1. Ergas, S. J., Kinyua, M.N., van der Steen, P., **Butler, C.S.**, Lens, P. N. L., Chandran, K. and Mihelcic, J. R., Spotlight: Special Issue of Environmental Engineering Science: Innovative Global Solutions for Bioenergy Production, *Environmental Engineering Science*, Vol. 33, No. 11, 2016
2. **Butler, C.S.** and Boltz, J.P., *Biofilm Processes and Control in Water and Wastewater Treatment*, Comprehensive Water Quality and Purification, Elsevier Major Reference Work, 2013

## Conference Papers

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\* indicates graduate students and postdocs, \*\* indicates undergraduate students

1. Abouhend, A\*, Kuo-Dahab, C\*, **Butler, C.S.**, Hamelin, J., Milfredstedt, K., and Park. C, Formation of oxygenic photo-granules and its application for aeration-free wastewater treatment, *Water Environment Federation Technical Exhibition and Conference*, Chicago, IL, September 2017
2. Abouhend, A\* , **Butler, C.S.**, El-Moselhy, K. and Park. C, The Oxygenic Photogranule (OPG) for Aeration-free and Energy-Recovery Wastewater Treatment Process, *Water Environment Federation Technical Exhibition and Conference*, New Orleans, LA - October 2016
3. Weinrich, J\* and **Butler, C.S.**, Determining Kinetic Parameters Of A Nitrite-accumulating, Denitrifying, Cathode-oxidizing Biofilm, *Water Environment Federation Technical Exhibition and Conference*, New Orleans, LA - October 2014
4. Bekki, J. M., Dalrymple, O., and **Butler, C.S.**, A Mastery-Based Learning Approach for Undergraduate Engineering Programs, *Frontiers in Education*, Seattle, WA, October 2012 (*1 citation*)
5. **Butler, C.** and Nerenberg, R., Effects of Oxygen Crossover on Layered, Microbial Fuel Cell Assemblies. *International Water Association/Water Environment Federation Biofilm Reactor Technology Conference*, Portland, Oregon, August 2010
6. **Butler C.**, Clauwaert, P., Verstraete, W., and Nerenberg, R, Bioelectrochemical Perchlorate Reduction in a Microbial Fuel Cell: Optimizing Cathode pH and Cathode Potential. *IWA/WEF Biofilm Reactor Technology Conference*, Portland, Oregon, August 2010
7. Brown, D\*\*, Burns, B\*\*, Cradic, Z\*\*, Petrakovitz, D\*\*, Reeg, M\*\*, Santos, N\*\*, and **Butler, C.**, Optimization of Drinking Water Solutions for Rural Villages in Ghana, Africa, *Capstone Design Conference*, Boulder, CO, June 2010
8. **Butler, C.** and Nerenberg, R., Effects of Oxygen Crossover on Microbial Fuel Cell Performance and Microbial Community Structure. *International Water Association Leading Edge Technology*, - Phoenix, AZ, June 2010
9. **Butler C.**, Clauwaert, P., Verstraete, W., and Nerenberg, R, Optimizing Cathode pH and Cathode Potential for Bioelectrochemical Perchlorate Reduction. *International Water Association Leading Edge Technology*, - Phoenix, AZ, June 2010
10. **Shea, C.** and Nerenberg, R., BOD and Total Nitrogen Removal from Wastewater Using Microbial Fuel Cells. *Water Environment Federation Nutrient Removal Conference*, Washington D.C. - June 2009
11. **Shea, C.** and Nerenberg, R., A High-Performance, Air-Cathode Microbial Fuel Cell with Potential for Retrofitting into Activated Sludge Plants. *Water Environment Federation Technical Exhibition and Conference*, Chicago, IL - October 2008
12. **Shea, C.** and Nerenberg, R., Performance of Air-Cathode Microbial Fuel Cells with Layered-Electrode Assemblies. *International Water Association Young Water Professionals Conference*, Berkeley, CA - July 2008
13. **Shea, C.** and Nerenberg, R. Air-cathode microbial fuel cells with layered-electrode assemblies. *International Water Association Leading Edge Technologies*, Zurich, Switzerland - June 2008
14. **Shea, C.** and Nerenberg, R. Adapting a Denitrifying Biocathode for Perchlorate Reduction. *International Water Association Leading Edge Technologies*, Zurich, Switzerland - June 2008
15. **Shea, C.** and Nerenberg, R. Air-cathode microbial fuel cells with layered-electrode assemblies. *Microbial Fuel Cells - First International Symposium*, Pennsylvania State University, State College, PA - May 2008

16. **Shea, C.** and Nerenberg, R. Hollow-Fiber Membrane Microbial Fuel Cells: Retrofitting Activated Sludge for Direct Production of Electricity. Indiana Water Environment Federation Annual Conference, Indianapolis, IN - November 2007
17. McStay, F., Talley, J.W., **Shea, C. A.** Landfarming as a Bioremediation Techniques for Oil Contaminated Lands in Iraq. National Association for Environmental Professionals Annual Conference (NAEP), Alexandria, VA - April, 2005
18. Strom, S., Jaffray, S., Johnson, C., McCartney, J., Rossmeier, K., **Shea, C.**, Zhang, M., Changes in Spatial Perception as a Result of Changes in Gravity, Society of Women Engineers National Conference, Birmingham, AL - 2003

## Conference Abstracts

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\* indicates graduate students and postdocs, \*\* indicates undergraduate students

1. Downes, S.\* , and **Butler, C.**, The Role of Light on the Success and Morphology of Oxygenic Photogranules, IWA Leading Edge Technologies, Edinburgh, UK, June 2019
2. **Butler, C.**, The Role of Light on the Success and Morphology of Oxygenic Photogranules, Association for Environmental Engineering and Science Professors, Tempe, AZ, May 2019
3. Downes, S.\* , and **Butler, C.**, Simulation of oxygen consumption and diffusion in phototrophic-chemotrophic granular biofilms used in wastewater treatment, Association for Environmental Engineering and Science Professors, Tempe, AZ, May 2019
4. Downes, S.\* , and **Butler, C.**, The Role of Light on the Success and Morphology of Oxygenic Photogranules , New England Graduate Student Water Symposium, September 2018 - **Best Poster Award**
5. Rodriguez, J.\* , and **Butler, C.**, Nanoparticle Transport in Biofilms, New England Graduate Student Water Symposium, September 2018 - **Third Place, Best Presentation Award**
6. Hann, M.\* , Downes, S.\* , Rodriguez, J.\* , and **Butler, C.**, Formation of phototrophic granular biofilms for oxygenic wastewater treatment, American Chemical Society, Boston, MA, August 2018
7. **Butler, C.**, Phototrophic Granular Biofilms, Biofilms Mechanic Workshop, Notre Dame, IN, April 2018
8. Hann, M.\* , Rodriguez, J.\* , Downes, S. and **Butler, C.**, Impact of Oscillatoria and Nitrogen Availability on Oxygenic Photogranule Formation under Static Conditions, NEWEA Annual Meeting, Boston, MA, January 2018
9. Hann, M.\* , Rodriguez, J.\* , Downes, S. and **Butler, C.**, Oxygenic Photogranule Formation under Static Conditions, New England Graduate Student Water Symposium, September 2017
10. Kuo-Dahab, W.C.\* , Stauch-White, K.\* , **Butler, C.**, Carbajal-Gonzalez, B., Ivanova, A. Park, C., Characterization and elucidation of oxygenic granule formation in a static environment, Association of Environmental Engineering and Science Professors Conference, Ann Arbor, MI, June 2017
11. Rodriguez, J.\* , Hann, M.\* and **Butler, C.**, Determining the Physiological Mechanisms and Morphological Integrity of Oxygenic Photogranules for Wastewater Treatment, Association of Environmental Engineering and Science Professors Conference, Ann Arbor, MI, June 2017
12. Srinivasan, V.\* and **Butler, C.**, Robustness and Resiliency of Anode-Respiring Biofilms to Perturbations with Nitrate, Association of Environmental Engineering and Science Professors Conference, Ann Arbor, MI, June 2017
13. Rodriguez, J.\* , Hann, M.\* and **Butler, C.**, Determining the Physiological Mechanisms and Morphology Integrity of Oxygenic Photogranules for Wastewater Treatment, Dublin, Ireland, May 2017
14. Srinivasan, V.\* and **Butler, C.**, Robustness and Resiliency of Anode-Respiring Biofilms to Perturbations with Nitrate, IWA Biofilms, Dublin, Ireland, May 2017
15. Spedding, C.\*\* , D'Andrea\*\*, L., Dozier, C., Reckhow, D., and **Butler, C.**, Pharmaceuticals and Personal Care Products in Urine-compost from a Community Garden. New England Water Environment Association, Boston, Ma, January 2017
16. **Butler, C.**, Clasby, D.\*\* , Srinivasan, V.\* , Castro, C.\* , Sathyamoorthy, S., FenGen: Direct Electricity Generation from Biosolids using a Hybrid Fermentation-Bioelectrochemical System. New England Water Environment Association, Boston, Ma, January 2017
17. Clasby, D.\*\* , Srinivasan, V.\* , Castro, C.\* , Sathyamoorthy, S., and **Butler, C.**, Direct Electricity Generation from Biosolids using a Hybrid Fermentation-Bioelectrochemical System. Water Environment Federation Technical Conference and Exhibition, New Orleans, LA, September 2016
18. Stauch-White, K.\* , Kuo-Dahab, C.\* , Park, C., **Butler, C.**, Nitrogen cycling in the cultivation oxygenic photogranules for wastewater treatment. IWA MEWE Biofilms, Copenhagen, Denmark, September 2016
19. Srinivasan, V.\* and **Butler, C.**, Evaluating the Robustness of Anode-Respiring Biofilms: Understanding the Dynamics of Interactions between Anode-Respiring and Denitrifying Bacteria, New England Graduate Water Research Symposium, Amherst, MA, September 2015
20. Jack, J.\* and **Butler, C.**, Inhibition of Methanogenesis in MFC Anode Communities, New England Graduate Water Research Symposium, Amherst, MA, September 2015

21. Stauch-White, K.\*, Kuo-Dahab, C.\* and **Butler, C.**, The ecology and locational preferences of microalgae and bacteria in granular biofilms used for treating wastewater, New England Graduate Water Research Symposium, Amherst, MA, September 2015
22. Castro, C.\*, Vargas, I. and **Butler, C.**, Azufre River Sediments as an Inoculum for MFCs: Boon or Bane?, New England Graduate Water Research Symposium, Amherst, MA, September 2015
23. Srinivasan, V.\* and **Butler, C.**, Competition between Denitrifiers and Anode-respiring Bacteria, American Chemical Society Meeting, Boston, MA, August 2015
24. Ikuma, K., Kim, S., Reckhow, D., **Butler, C.**, Removal and Transformation of Pharmaceuticals and Personal Care Products by Onsite Wastewater Treatment Systems, Association of Environmental Engineering and Science Professor Conference, Yale University, New Haven, CT June 2015
25. Srinivasan, V.\* and **Butler, C.**, Evaluating the Robustness of Anode-Respiring Biofilms: A Battle for Acetate Between Exoelectrogens and Denitrifiers, Association of Environmental Engineering and Science Professor Conference, Yale University, New Haven, CT June 2015
26. Srinivasan, V.\* and **Butler, C.**, Evaluating the Robustness of Anode-Respiring Biofilms: A Battle for Acetate Between Exoelectrogens and Denitrifiers, Association of Environmental Engineering and Science Professor Conference, Yale University, New Haven, CT June 2015
27. Stauch-White, K.\*, Kuo-Dahab, C.\*, Park, C. and **Butler, C.**, The ecology of granular biofilms containing microalgae and bacteria used for treating wastewater, Association of Environmental Engineering and Science Professor Conference, Yale University, New Haven, CT June 2015
28. Stauch-White, K.\*, Kuo-Dahab, C.\*, Milferstedt, K., Hamelin, J., Park, C. and **Butler, C.**, Filamentous cyanobacteria in granular biofilms containing microalgae and bacteria, Meeting of the American Chemical Society, Denver, CO March 2015
29. Stauch-White, K.\* and **Butler, C.**, Investigation of DNA extraction protocols for granular biofilms containing microalgae and bacteria, New England Graduate Student Water Symposium, Amherst, MA, September 2014
30. Srinivasan, V.\* and **Butler, C.**, Competition for electron donors in Anode-Respiring Biofilms, New England Graduate Student Water Symposium, Amherst, MA, September 2014
31. Castro, C.\*, and **Butler, C.**, Large scale MFC for organic and nitrogen removal from synthetic human waste., North American Meeting of the International Society of Microbial Electrochemistry and Technology, State College, PA, May 2014
32. Srinivasan, V.\* and **Butler, C.**, Competition for electron donors in Anode-Respiring Biofilms, North American Meeting of the International Society of Microbial Electrochemistry and Technology, State College, PA, May 2014
33. Castro, C.\*, and **Butler, C.**, Microbial Fuel Cell for Nutrient and Organic Removal from Domestic Waste on Cape Cod, Smarter Cape Cod Economic Summit, May 2014
34. Castro, C.\*, and **Butler, C.**, The MFC Latrine: Electricity-yielding, Decentralized Wastewater treatment for Rural Areas., New England Water Environment Association Energy and Sustainability Joint Specialty Conference, Sturbridge, MA, May 2014
35. Castro, C.\*, Goodwill, J.\*, Rogers, B., Henderson, M., **Butler, C.**, Decentralized Organic and Nitrogen Removal from Domestic Waste in Rural Ghana with a Microbial Fuel Cell, New England Water Environment Association, Boston, MA, January 2013
36. Srinivasan, V.\*, Castro, C.\*, Weinrich, J.\* and **Butler, C.**, Wastewater Treatment and Bioelectrochemical Systems. Joint NSF-GOI Workshop on Implementation of Sustainable Technologies for Water / Wastewater Treatment and Water Reuse, Chennai, India, January 2013
37. Castro, C.\*, Goodwill, J.\*, Rogers, B., Henderson, M., **Butler, C.**, Decentralized Organic and Nitrogen Removal from Domestic Waste in Rural Ghana with a Microbial Fuel Cell, Fecal Sludge Management Conference, Durban, South Africa, November, 2012
38. Weinrich, J.\*, **Butler, C.**, Kinetics of nitrate-reduction and nitrite-accumulation in a denitrifying biocathode, North American Meeting of the International Society of Microbial Electrochemical Technologies, Cornell, NY, October 2012
39. Castro, C.\*, Goodwill, J.\*, **Butler, C.**, Decentralized Organic and Nitrogen Removal from Domestic Waste in Rural Ghana with a Microbial Fuel Cell, North American Meeting of the International Society of Microbial Electrochemical Technologies, Cornell, NY, October 2012
40. Castro, C.\*, Goodwill, J.\*, **Butler, C.**, Development of the First Microbial Fuel Cell Composting Latrine, WEFTEC, New Orleans, LA, October 2012
41. Dalrymple, O., Bekki, J., **Butler, C.**, Work in Progress: Modifying Mastery Based Learning for use in Undergraduate Engineering Courses, Frontiers in Education, Rapid City, SD, October 2011
42. Dulebohn, D.\*\*, Reidhead, P.\*\*, and **Butler, C.**, Sustainable Organic and Nutrient Removal from Agricultural Waste Streams via Microbial Fuel Cells. International Bioremediation Symposium, Reno, NV, June 2011
43. Nerenberg, R., Downing, L., Martin, K., **Butler, C.**, and Read-Daily, B., Advances in Hollow-Fiber Membrane Biofilm Reactor (MBfR) Technology for Water and Wastewater Treatment, Borchardt Conference, Ann Arbor, MI, February 2011
44. Brown, D.\*\*, Burns, B.\*\*, Cradic, Z.\*\*, Petrakovitz, D.\*\*, Reeg, M.\*\*, Santos, N.\*\*, and **Butler, C.**, Civil Infrastructure Challenges in Ghana, Africa. Student Design Competition, National Academy of Engineering Grand Challenges Summit, Phoenix, AZ, April 2010
45. **Butler C.**, Clauwaert, P., Verstraete, W., and Nerenberg, R, Bioelectrochemical perchlorate reduction in a microbial fuel cell. ACS National Meeting, San Francisco, CA - March 2010



46. **Butler C.**, Pavissich, J.P., and Nerenberg, R, Total Nitrogen Removal in a Microbial Fuel Cell, ACS National Meeting, San Francisco, CA - March 2010
47. **Butler, C.** and Nerenberg, R., Impact of oxygen crossover on layered electrode assembly, air cathode MFCs. American Chemical Society National Meeting, San Francisco, CA - March 2010
48. **Shea, C.** and Nerenberg, R., Effect of oxygen crossover on microbial fuel cell biofilms. IWA Processes in Biofilms, University of California, Davis - September 2009
49. **Shea, C.** and Nerenberg, R., Bioelectrochemical perchlorate reduction in a microbial fuel cell. IWA Processes in Biofilms, University of California, Davis - September 2009
50. **Shea, C.** and Nerenberg, R. Air-cathode microbial fuel cells with layered-electrode assemblies. Microbial Fuel Cells - First International Symposium, Pennsylvania State University, State College, PA - May 2008
51. **Shea, C.** and Nerenberg, R. Microbial Fuel Cell for Total Nitrogen Removal. Microbial Fuel Cells - First International Symposium, Pennsylvania State University, State College, PA - May 2008
52. **Shea C.**, Clauwaert, P., Verstraete, W., and Nerenberg, R. Adapting a Denitrifying Biocathode for Perchlorate Reduction. Microbial Fuel Cells - First International Symposium, Pennsylvania State University, State College, PA - May 2008
53. Wilbur, P.\* and **Shea, C.**, Proton Exchange Membranes in Microbial Fuel Cells. Undergraduate Scholars Conference, University of Notre Dame, May 2008
54. Nerenberg, R. and **Shea, C.**, Microbial Fuel Cells for Sustainable Energy Production from Wastewater, Biofuels Symposium, Purdue University, September 2007
55. **Shea, C.**, Green, S.J., Nerenberg, R., Microbial Fuel Cells: Changes in Microbial Community Structure as a Function of Anode Potential. Fourth American Society for Microbiology Conference on Biofilms, Quebec City, Quebec - March 2007
56. **Shea, C.**, Johnson, C., Strom, S., Rossmeyer K., Zhang, M., Jaffray, S., McCartney, J., Changes in Spatial Orientation and Vestibular Behavior as a Result of Changes in Gravity. Collaboration Celebration, Smith College, Northampton, Ma - April 2003
57. **Shea, C.** and Queeney, K.T., Mechanistic Study of the Oxidation of H-terminated Silicon: The Role of Dissolved Oxygen. American Vacuum Society International Symposium, Baltimore, MD - November 2003
58. **Shea, C.** and Voss, S.E., Intra-subject versus Inter-subject variability of the Impedance of the Human Ear Canal. Association for Research in Otolaryngology Midwinter Meeting, St. Petersburg, FL - January 2002

## Invited Panels, Presentations and Seminars

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1. **Butler, C.** Engineering Biofilms for Treatment of Environmental Systems, New Frontiers in Bioinspiration: A Center for Evolutionary Materials Symposium, June 2019
2. **Butler, C.** Academic Research Panel, New England Water Innovation Network Innovation Pavillion, New England Water Environment Association, January 2019
3. **Butler, C.** Academic Research Panel, Water Innovation Day, University of Massachusetts, Amherst, October 2018
4. **Butler, C.** Energy and Resource Recovery in Wastewater Treatment, Water Innovation Workshop, Worcester Polytechnic Institute, Worcester, MA, October 2016
5. **Butler, C.** Resource Recovery in Wastewater Treatment, Harvard University, Cambridge, MA, September 2015
6. **Butler, C.**, Backer, S., Sherer, R., Work-Life Balance, Senior Design Clinic, Smith College, April 2015
7. **Butler, C.** Bioelectricity Generation from Wastewater Treatment, State University of New York Polytechnic, Albany, NY, 2014
8. **Butler, C.**, Hooker, B., Klare, M., Global Trends Forum, Smith-Tuck Global Leaders Program for Women, Smith College, 2014
9. **Butler, C.**, Decentralized, electricity-producing biological treatment of organic and nitrogen components of domestic waste, Northeast Bioengineering Conference, Northeastern, May 2014
10. Burnside, A, **Butler, C.**, Holmes, D., McKeown, K.A., Rapp, L, Academic Career Panel, Exploring Careers in Academia, Graduate Women in STEM, UMass, December 2013
11. **Butler, C.**, Life after Smith and Engineering Design for the Developing World, Introduction to Engineering in the Department of Engineering, Smith College, Northampton, MA - October 2013
12. **Butler, C.**, Sustainable Sanitation Solutions for the Developing World, Introduction to Engineering in the Department of Engineering, Smith College, Northampton, MA - November 2012
13. **Butler, C.**, The Microbial Fuel Cell Latrine, Holyoke Community College, Holyoke, MA - November 2012

14. **Butler, C.** Bioelectrochemical Systems: opportunities for energy recovery while meeting treatment objectives, BioWET: Biological Waste to Energy Summer School, University of South Florida, Tampa, FL - July 2012
15. **Butler, C.** International Society for Industrial Ecology Future Faculty Workshop, IEEE International Symposium for Sustainable Systems and Technology, Boston, MA - May 2012
16. **Butler, C.** Bioelectricity Generation from Wastewater Treatment: Opportunities for Sustainability, Department of Civil Engineering, University of Massachusetts, Dartmouth, Dartmouth, MA - February 2012
17. **Butler, C.** Fundamental and Applied Studies of Microbial Fuel Cells for Sustainable Water and Wastewater Treatment, Environmental and Water Resources Engineering Department, Tufts University, Medford, MA - February 2012
18. Chen, Q., **Butler, C.**, Green, D., Hristovski, K., McKenna, A., Tridane, A., Undergraduate Research. Annual College Retreat, College of Technology and Innovation, Arizona State University, Mesa, AZ - January 2011
19. **Butler, C.** Performance and Microbial Ecology of Microbial Fuel Cells with Biocathodes. North American BioElectric Systems Meeting, University of Massachusetts, Amherst, MA - October 2010
20. **Butler, C.**, Fundamental and Applied Studies of Microbial Fuel Cells for Sustainable Water and Wastewater Treatment. School of Sustainable Engineering and the Built Environment, Arizona State University, Tempe, AZ - February 2010
21. Chantem, T., McCumbers, R., **Shea, C.**, Building Community Through Improved Communication. Midwest Regional Conference of the National Association of Graduate and Professional Students, Notre Dame, IN - March 2009
22. Chantem, T., McCumbers, R., **Shea, C.**, Graduate Student Union - Progress and Future Goals. University of Notre Dame Board of Trustees, Notre Dame, IN - October 2008
23. Chantem, T., McCumbers, R., **Shea, C.**, Graduate Student Union - State of the Union Report. University of Notre Dame Board of Trustees, Notre Dame, IN - October 2007
24. **Shea, C.**, Sausville-Giddings, C., Taugher, M., Biological Nitrogen Removal via Partial Nitrification and Denitrification. Metcalf and Eddy, New York, New York - May 2004

## Funded Projects

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Total as a PI: \$772,600

Total as a co-PI: \$7,998,405

1. *3D Printed Biomimetic Biofilm Supports for Treatment Systems*, PI: **C. Butler**, co-PI: S. Gerasimidis, Massachusetts Technology Transfer Center, January 2019-April 2019, \$15,000
2. *CBET-EPSRC: Characterizing the effects of supply hours and pressure of intermittent piped water supplies on water quality*, PI: E. Kumpel, co-PI: **C. Butler**, EPSRC PI: V. Speight, National Science Foundation, September 2018-August 2021, \$321,405
3. *Advancing the Oxygenic Photogranule Process for Energy Positive Wastewater Treatment*, PI: C. Park, co-PI: **C. Butler** and C. Wilson, Water Environment and Reuse Foundation, April 2017-May 2019, Funding Awarded: \$15,000
4. *GOALI: Advancing the Oxygenic Photogranule Process for Energy Positive Wastewater Treatment*, PI: C. Park, co-PI: **C. Butler** and C. Wilson, National Science Foundation, June 2016-May 2019, Funding Awarded: \$320,000
5. *Microbial attenuation of non-point source pharmaceutical and personal care products pollution from antiquated septic systems in coastal communities*, PI: **C. Butler**, co-PI: K. Ikuma, Massachusetts Water Resources Research Center/USGS, March 2015-February 2016, Funding Awarded: \$30,000
6. *NSF CAREER: Fundamental Studies of Cross-Kingdom Aggregate Biofilms for Energy-Efficient Wastewater Treatment*, PI: **C. Butler**, National Science Foundation, June 2015-May 2020, Funding Awarded: \$500,000  
  
*Supplemental Funding: CAREER-Life Balance Initiative: Fundamental Studies of Cross-Kingdom Aggregate Biofilms for Energy-Efficient Wastewater Treatment*, PI: **C. Butler**, National Science Foundation, September 2017-December 2017, Funding Awarded: \$26,000
7. *NSF MRI: Acquisition of A Versatile High Resolution MS System for Determination of Small Molecules of Environmental and Health Concern*, PI: David Reckhow, co-PIs: C. Park, J. Tobiason, **C. Butler**, National Science Foundation Major Research Instrumentation Opportunity, September 2014-August 2016, Funding Awarded: \$455,000
8. *Enhanced Fuel Cells From Wastewater Treatment*, PIs: **C. Butler**, M. White, Air Force Small Business Innovation Research Grant, July 2014-June 2015, Funding Awarded: \$149,582
9. *Water Innovation Network for Sustainable Small Systems (WINSSS)*, National Center for Innovation in Small Drinking Water Systems, PI: David Reckhow, co-PIs: Tobiason, John; **Butler, Caitlyn**; Park, Chul; Shenoy, Prashant; Lawler, Desmond; Kirisits, Mary J.; Katz, Lynn; Kinney, Kerry; Speitel, Gerald; Saleh, Navid; Dvorak, Bruce; Ray, Chittaranjan; Lai, Rebecca; Wilson, Steve; Boyer, Treavor; Zhang, Qiong; Brown, Jess, Environmental Protection Agency, July 2014-June 2017, Funding Awarded: \$4,099,999

10. *Elucidating Novel Algal-Sludge Granule for Wastewater Treatment and Biomethane Feedstock Production*, PI: Chul Park, co-PI: **C. Butler**, National Science Foundation Chemical, Bioengineering, Environmental and Transport Systems, September 2013-August 2016, Funding Awarded: \$342,368
11. *Phase II: The Microbial Fuel Cell Latrine - Enhanced Electricity Recovery from Domestic Waste and Expanded Deployment*, PI: **C. Butler**, co-PIs: Mark Henderson and Brad Rogers, Gates Grand Challenges Explorations, May 2013-April 2015, Funding Awarded: \$100,000
12. *Electrofuels via Direct Electron Transfer from Electrodes to Microbes* PI: D. Lovley, co-PIs: K. Nevin, **C. Butler** and T. Russell, Applied Research Project Agency - Energy (ARPA-E), January 2012-June 2013, Funding Awarded: \$2,300,000
13. *Adapting Traditional Pit Latrine in the Developing World for Nitrogen Removal and Electricity Production* PI: **C. Butler**, Co-PIs: M. Henderson and B. Rogers, Gates Foundation Grand Challenges Explorations, November 2011-May 2013, Funding Awarded: \$100,000
14. *Organics and Nitrogen Removal from Agricultural Waste Streams via Microbial Fuel Cells* PI: **C. Butler**, Western Alliance for Extending Student Opportunities, June 2009-August 2009, Funding Awarded: \$1600 for an undergraduate research assistant and supplies.

## Internally Supported Projects

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Total: \$63,430

1. NSF Advance Grant, University of Massachusetts, Amherst, MA  
*Peer Mentoring to Improve Collaborative Relationships* PI: K. Peterman, co-PI: **C. Butler**, E. Christofa, E. Kumpel, and S. Gao, Funding Awarded: \$6,000, June 2019-June 2020
2. Center for Teaching Excellence and Faculty Development, University of Massachusetts, Amherst, MA  
*Informal mentoring: navigating mentoring challenges when no model exists*, PI: K. Peterman, co-PI: **C. Butler**, E. Christofa, E. Kumpel, and S. Gao, Funding Awarded: \$6,000, June 2018-June 2019
3. Office of Research Development Public Service Engagement Grant, University of Massachusetts, Amherst, MA  
*Characterization of Pharmaceuticals in Urine-compost at the Grow Food Northampton Community Organic Garden*. PI: **C. Butler**, co-PI: D. Reckhow, Funding Awarded: \$10,000, July 2016-June 2017
4. Department of Engineering, The Polytechnic School, Arizona State University, Mesa, AZ  
*Capital Equipment and Undergraduate Student Support for Molecular Analysis of Biocathode Biofilms* PI: **C. Butler**, Funding Awarded: \$35,720
5. Graduate School Professional Development Funding Opportunity, University of Notre Dame, Notre Dame, IN  
*First Annual Graduate Research Symposium* Co-PIs: McCumbers, R., Chantem, T., **Shea, C.**, Funding Awarded: \$12,200
6. College of Engineering - Energy Center Curriculum Development Grant, University of Notre Dame  
*Integration of Energy Topics into Environmental Biotechnology and Wastewater Treatment Design* PI: Nerenberg, R. and co-PI: **Shea, C.**, Funding Awarded: \$3,500

## Professional Activities

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*Ad Hoc Proposal Reviewer*, 2019, Independent Research Fund Denmark

*Ad Hoc Proposal Reviewer*, 2018, USGS

*Ad Hoc Proposal Reviewer*, 2018, USDA NIFA

*Advisory Council* - Picker Engineering Program, Smith College - 2018-present

*Awards Committee* - Association of Environmental Engineering and Science Professors - 2017 - present - reviews awards applications

*University Forum Committee* - American Water Works Association - 2016- 2019 - reviews scholarship application and student research abstract

*National Science Foundation CAREER Review Panel*, 2018, 2016, 2015 - CBET, Environmental Engineering

*Ad Hoc Proposal Reviewer*, 2016, Canadian Research Chairs Program, Tier II Chair

*Guest Editor*, 2016, Special issue of Environmental Engineering Science, Innovative Global Solutions for Bioenergy Production.

*Ad Hoc Proposal Reviewer*, 2016, USDA SBIR Phase II

*Invited Participant*, 2016, NSF/WEF/DOE Workshop for Creating Metrics for a National Wastewater Testbed Network, Washington, D.C.

*Ad Hoc Proposal Reviewer*, 2015 - Israeli Ministry of Science, Technology and Space - Division of Applied Engineering Research

*Reviewer*, 2015 - International Society for Microbial Electrochemistry and Technology Awards

*Invited Participant*, 2014 Sustainable and Resilient Water Solutions for Rural Communities Workshop, Glasgow University, Scotland

*Advisory Board* - 2014 North American Meeting of International Society for Microbial Electrochemistry and Technology

*Membership Committee Member* - International Society for Microbial Electrochemistry and Technology- 2013-2014

*Lecturers Committee Member* - Association of Environmental Engineering and Science Professor - 2013-2018

*Biofilm Interest Group Member* - Water Environment Federation - 2012-2013

*Session Chair/Organizer* - Microbial-based Fuel Cells - International Symposium on Bioremediation and Sustainable Environmental Technologies, 2011

*Session Moderator* - Microbial Fuel Cells - Water Environment Federation/ International Water Association Biofilm Reactor Technology Conference, 2010

*Scientific Committee* - Young Professional Member - Water Environment Federation/ International Water Association Biofilm Reactor Technology Conference, 2010

*National Science Foundation Review Panel*, CCLI (now called TUES), 2010

*Ad Hoc Reviewer* - Applied Microbiology and Biotechnology, Biofouling, Bioresource Technology, Biotechnology and Bioengineering, Chemistry Communications (**Outstanding Reviewer, March 2019**), Environmental Engineering Science, Environmental Science: Water Research and Technology (**Outstanding Reviewer, 2019**), IWA Journal for Water, Sanitation and Hygiene Development, Environmental Science and Technology, PLOS one, Water Research, and Water Science and Technology, 2007-present

*Session Moderator* - Water Quality and Availability - Notre Dame Environmental Education and Research Symposium, 2006

*Professional Memberships*: Association of Environmental Engineering and Science Professors (AEESP), American Society of Engineering Education (ASEE), International Water Association (IWA), Water Environment Federation (WEF), American Chemical Society (ACS)

## University and Department Service

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### University of Massachusetts, Amherst, MA

*Ad Hoc Reviewer*, 2016, Office of Research Development, Faculty Research Grant

*Ad Hoc Reviewer*, 2016, 2018, Commonwealth Honors College, Honors Thesis Grants

*Ad Hoc Reviewer*, 2019, Office of Research Development, Armstrong Research Program

### College of Engineering, University of Massachusetts, Amherst, MA

*Faculty Awards Committee*, 2019, participated in a review of faculty award applications

*Dean Search Committee*, 2018-2019, participated in a search for the College of Engineering Dean

*Summer Engineering Institute*, 2018,2019 contributed an activity where students designed tiny house to explore concepts of thermal conduction

### Civil and Environmental Engineering, University of Massachusetts, Amherst, MA

*Graduate Program Director*, 2019-present, oversees the milestones for graduate student progress

*CEE Open House Committee*, 2017-2019, plans and executes Open House activities for prospective and admitted students to College of Engineering

*EWRE Awards Committee*, 2017-present, compiles lists of environmental and water resources awards appropriate for the accomplishments of EWRE faculty and initiates the nomination process

*CEE Curriculum Committee*, 2016-2018, review materials and proposal relevant to the Civil Engineering curriculum

*CEE Water Resources Search Committee*, 2015-2016, performing a faculty search in the area of water resources

*CEE History and Heritage Lecture Committee*, 2015-2019, organized the History and Heritage Lectures

*CAREER Award Panel*, April 2015, served on a panel of CAREER awardees to share our experiences of preparing a successful CAREER proposal

*Ph.D. Exams*, Summer 2019, Winter 2019, Winter 2017, Summer 2016, Summer 2015, Summer 2014, Summer 2013, Winter 2013, created, administered and graded the Biological Principles Exams for EWRE Ph.D. students and/or served on Oral Exam committee for students.

*Engineering Open House*, Spring 2017, Spring 2016, Spring 2015, Fall 2014, Fall 2013, gave presentations and coordinated environmental engineering activities for prospective undergraduate students.

*New Student Orientation*, Summer 2012-2017, advised incoming first-year students on their first semester coursework

*CEE Alumni Networking Social*, June 2014, organized a CEE Alumni Networking Social with invited speaker John Sullivan of Boston Water and Sewer Commission, raising **\$10,000 in sponsorship and ticket sales**

**Department of Engineering, College of Technology and Innovation, Arizona State University, Mesa, AZ**

*Civil Engineering Focus Area Committee, 2010-2011* - served on a committee to redevelop the curriculum for the Civil Engineering focus area for the Department of Engineering

*Combined First Year Curriculum Committee, 2010-2011* - served on a committee to review and revise curricula for combined first year project-based courses for the Departments of Engineering and Computing Studies

*Undergraduate Committee, 2010-2011* - served on a committee to strengthen the undergraduate education within the Department of Engineering

*College of Technology and Innovation Writing Group, 2010-2011*, - collaborated with a collective of faculty to share and review documents related to our professional development