

Oswaldo A. Broesicke E.I.T.

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CERTIFICATIONS

Engineer in Training - 48358

2013

Texas Board of Professional Engineers

EDUCATION

Ph.D. Environmental Engineering | GPA: 3.90/4.00

Est. 2020

Georgia Institute of Technology

Thesis Subject: Multidisciplinary design optimization for urban infrastructure systems

M.S. Civil Engineering | GPA: 4.00/4.00

2015

University of Texas at El Paso

Thesis: Salt and mineral recovery from high salinity waters

B.S. Civil Engineering | GPA: 3.82/4.00

2012

University of Texas at El Paso

Honors: Magna Cum Laude

PUBLICATIONS

Yan, J., **Broesicke, O. A.**, Wang, D., Li, D., & Crittenden, J. C. (2019). *Parametric life cycle assessment for distributed combined cooling, heating and power integrated with solar energy and energy storage*. *Journal of Cleaner Production*, 119483.

<https://doi.org/10.1016/j.jclepro.2019.119483>

Tong, X., Liu, S., Yan, J., **Broesicke, O. A.**, Chen, Y., & Crittenden, J. (2019). *Thermolytic osmotic heat engine for low-grade heat harvesting: Thermodynamic investigation and potential application exploration*. *Applied Energy*, 114192.

<https://doi.org/10.1016/j.apenergy.2019.114192>

Lu, Z.; **Broesicke, O. A.**; Chang, M. E.; Yan, J.; Xu, M.; Derrible, S.; Mihelcic, J. R.; Schwegler, B.; Crittenden, J. C. *Seven Approaches to Manage Complex Coupled Human and Natural Systems: A Sustainability Toolbox*. *Environ. Sci. Technol.* **2019**. <https://doi.org/10.1021/acs.est.9b01982>.

National Academies of Sciences, Engineering, and Medicine. *Environmental Engineering for the 21st Century: Addressing Grand Challenges*. Washington, DC: The National Academies Press. (2019)

- Contributed on behalf of John C. Crittenden

Rocha-Melogno, L., Yoo, R., **Broesicke, O.**, Kallergis, A., Garcia, J., Herbas, E., Torrez-Daza, A., Johnson, A., Boey, D., Beard, V., Frisbie, S. H., Murcott, S. & Brown, J. *Rapid drinking water safety estimation in cities: Piloting a globally scalable method in Cochabamba, Bolivia*. *Sci. Total Environ.* 654, 1132–1145 (2019).

Jeong, H., **Broesicke, O. A.**, Drew, B., & Crittenden, J. C. *Life cycle assessment of small-scale greywater reclamation systems combined with conventional centralized water systems for the City of Atlanta, Georgia*. *Journal of Cleaner Production*. 174, 333-342 (2018).

James, J.A., Sung, S., Jeong, H., **Broesicke, O. A.**, French, S. P., Li, D., Crittenden J. C., *Impacts of Combined Cooling, Heating, and Power Systems and Rainwater Harvesting on Water Demand, Carbon Dioxide and NOx Emissions for Atlanta*.

Environmental Science & Technology. 52(1), 3-10 (2017).

Jeong, H., **Broesicke, O. A.**, Drew, B., Li, D. & Crittenden, J. C. *Life cycle assessment of low impact development technologies combined with conventional centralized water systems for the City of Atlanta, Georgia*. *Frontiers of Environmental Science & Engineering*. 10(6), 1-13 (2016).

Alamailes, A., Walton, J., Sandoval, P., Woocay, A., & **Broesicke, O.** *Sustainable House-Scale Passive Rainwater Capture Landscape in the Desert Southwest*. *Journal of Green Building*, 9(1), 113–129. (2014).

RESEARCH EXPERIENCE

Graduate Research Assistant – Brook Byers Institute for Sustainable Systems

Aug 2015 – Present

Georgia Institute of Technology

Member of the Resilient and Interdependent Infrastructure Processes and Systems (RIPS) project

Investigate network flows and characteristics of infrastructure systems

Write grant proposals for research group

RESEARCH EXPERIENCE (CONTINUED)

- Graduate Research Assistant – Center for Inland Desalination Systems (CIDS)** **Sep 2014 – Aug 2015**
 University of Texas at El Paso
 Developed treatment for brine water source to yield high purity sodium chloride.
 Performed laboratory experiments and treatment simulations
- Graduate Researcher – Iracambi Atlantic Rainforest Research Center** **May 2013 – Jun 2013**
 University of Texas at El Paso
 Organized collaboration between Ball State University and the University of Texas at El Paso
 Developed site plans for Iracambi and aided in the construction of the central campus
- Research Assistant** **Aug 2012 – Dec 2012**
 Texas A&M AgriLife Research
 Analyzed the Specific Energy Consumption of various pumps for desalination at the Kay Bailey Hutchinson Water Treatment Plant.
- Undergraduate Research Assistant – CIDS** **Jul 2011 – Sep 2011**
 University of Texas at El Paso
 Performed feasibility study for the construction of a polishing wetland for the Sunland Park Wastewater Treatment Plant.
 Created preliminary design to provide adequate residence times for nutrient removal.

INDUSTRY EXPERIENCE

- Junior Engineer** **Feb 2013 – Oct 2014**
 Quantum Engineering Consultants Inc.
 Performed drainage analysis and assist engineers in design of developments.
 Created site plans, and drainage, grading, and design plans using AutoCAD.
- Technical Intern** **Nov 2010 – May 2011**
 ARCADIS
 Assisted engineers with on-site demolition and deconstruction, dust control, and reuse of materials for the former ASARCO copper smelter in El Paso, TX.
 Generated wind roses to assess critical locations for dust control.
- Student Engineer** **Jan 2010 – May 2010**
 ExxonMobil Chemical
 Provided support for mechanical contact engineers through research, database management, planning, and design.
 Created expansion joint database to minimize safety hazards to operators during repairs or turn-around.
 Designed and selected heat exchanger tubes to mitigate fouling issues.

TEACHING EXPERIENCE

- Graduate Teaching Assistant – Sustainability Engineering** **Aug 2016 – Dec 2018**
 Georgia Institute of Technology
 Design graduate course material, assignments, and examinations for sustainability engineering course Fall Semesters
 Occasionally lecture during instructor absences
- Graduate Teaching Assistant – Environmental Tech in the Dev. World** **Jan 2017 – May 2017**
 Georgia Institute of Technology
 Guide undergraduate students in planning, logistics, and project management for a drinking-water quality assessment in Cochabamba, Bolivia
 Assist instructor in coordinating with partner institutions: Universidad Católica Boliviana, the World Resources Institute, and Duke University
- Graduate Teaching Assistant – Hydraulics Engineering and Surveying** **Jan 2014 – May 2014**
 University of Texas at El Paso
 Grade course assignments and design laboratory experiments for undergraduate students

TEACHING EXPERIENCE (CONTINUED)**Graduate Teaching Assistant – Mechanics of Materials and Transportation Engineering****Oct 2013 – Jun 2014**

University of Texas at El Paso

Grade course assignments and tutor undergraduate students.

Peer Tutor – Student Leader**Jan 2008 – Dec 2009**

Academic Center for Engineers and Scientists (ACES) at the University of Texas at El Paso

Assisted students in all levels of STEM courses, while managing placement of all ACES peer tutors.

Developed tutor certification program to provide the most effective means of teaching students

Martial Arts Instructor**Aug 2007 – Aug 2015**

Kung Fu San Soo, El Paso

Taught children (3 – 15) and adults (16+)

PRESENTATIONS

“Multidisciplinary Design Optimization for Infrastructure Ecology Analysis and Decision Support” **2018**

Presented poster at the Gordon Research Conference for Industrial Ecology in Les Diablerets, Switzerland

“Infrastructure Ecology” **2017**

Guest speaker at the National Science Foundation’s “Urban Infrastructures: Analysis and Modeling for their Optimal Management and Operation” workshop, hosted by the New York Institute of Technology

“The role of urban sustainability in food security” **2016**

Guest speaker at the National Science Foundation’s Innovations at the Nexus of Food, Energy, and Water Systems (INFEWS) workshop, hosted by Georgia Tech

“Passive Rainwater Harvesting – The pathway to sustainable living in the desert southwest” **2014**

Guest speaker at the Sun Country Landscape Conference

AUTHORED GRANTS

PI: John C. Crittenden; Title: “SSDIM: Superimposed Simulations – Fast Generation of Synthetic Data of Interdependent Critical Infrastructures”; Funding Source: National Science Foundation Grant #1745580; Award Date: August 25, 2017 – August 31, 2019; Award Amount: \$180,000

PI: John C. Crittenden; Title: “Resilient Interdependent Infrastructure Processes and Systems (RIPS) Type 2: Participatory Modeling of Complex Urban Infrastructure Systems (Model Urban SysTems)”; Funding Source: National Science Foundation Grant #1441208;

- Supplement 3: “The SuRe Gap: Bridging the Gap Between Idealized and Attainable Infrastructure Sustainability and Resilience; Award Date: July 23, 2018 – August 31, 2019; Award Amount: \$150,000

AWARDS**Sloan Scholar, grant number G-2016-20166039****Aug 2017 - Present**

Alfred P. Sloan Foundation’s Minority Ph.D. (MPHD) Program

Padrino Award and Medalla de Plata**Oct 2016**

MAES (Latinos in Science and Engineering)

Recognition for achievements, dedication, and contribution to the Hispanic community in promoting & developing future STEM leadership

ARCS Scholar Award**Aug 2016-Present**

ARCS Foundation

Student award in recognition of academic excellence and influence within a growing community.

Georgia Power CEE Fellowship**Aug 2015**

Georgia Institute of Technology

Fellowship to assist first year doctoral students

AWARDS (CONTINUED)

American Water Works Association Scholarship

April 2015

American Water Works Association (AWWA)

Graduate student award for excellence in the field of water quality and water treatment

Patricia and Jonathan Rogers Scholarship

Jan 2014 – May 2015

University of Texas at El Paso

Gran Estudiante Award and Graduate Scholarship

Jan 2012 – Aug 2013

MAES (Latinos in Science and Engineering)

Graduate student scholarship honoring academic and professional excellence

Top Engineering Senior Award

May 2012

University of Texas at El Paso

Recognition for academic and extracurricular involvement throughout undergraduate career

1st Place Technical Paper Competition “Ethics and Globalization”

Jan 2011 – May 2012

American Society of Civil Engineers – Texas Region

Presidential Excellence Scholarship

Jan 2007 – May 2012

University of Texas at El Paso

PROFESSIONAL ORGANIZATIONS

U.S. Geological Service – National Institutes for Water Resources

Proposal Reviewer

Jun 2016 - Present

MAES - Latinos in Science and Engineering

Region 4 –Vice-Regional Student Representative

Jun 2017 – May 2018

Region 4 –Regional Student Representative

Jun 2016 – May 2017

American Society of Civil Engineers (ASCE)

Student Chapter President

Aug 2011 – May 2012

Student Chapter Historian

Aug 2013 – May 2014

American Water Works Association (AWWA)

Society of Hispanic Professional Engineers (SHPE)

United States Green Building Council

Student Chapter Secretary

Aug 2011 – May 2012