

Elizabeth A. Adams, Ph.D., P.E. | ladams15@calpoly.edu | 602-369-6346

CAREER SNAPSHOT

- Currently managing over \$1M in externally funded engineering education grants projects
- Over twelve years of experience teaching wide array of undergraduate engineering courses in community college and university settings
- Collaborated with 20+ universities and community colleges on over \$8M in grant funded engineering education projects
- Gained over three years of international work experience as a project engineer and project manager with CH2M HILL working in Okinawa, Japan
- Managed over \$25M in design and construction projects on Idaho Highways as a senior construction engineer and project manager

EDUCATION

- **Ph.D. Civil Engineering**, August 2013, Arizona State University, Tempe, Arizona. Dissertation advisor Dr. Benjamin L. Ruddell, Title: "Embedded Resource Accounting with Applications to Water Embedded in Energy Trade in the Western U.S."
- **M.S. Civil Engineering**, August 2006, University of Hawaii at Manoa, Honolulu, Hawaii. Thesis advisor Dr. Peter Nicholson, Title: "Effectiveness of a Slow-Sand Filter at a Road Maintenance Facility."
- **B.S. Civil Engineering** *cum laude*, May 2001, Boise State University, Boise, Idaho

PROFESSIONAL ENGINEERING LICENSURE

State of Hawaii, license number 11885 | State of Arizona, license number 47168

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers | American Society for Engineering Education
Society of Women Engineers

HONORS AND AWARDS

- Chandler-Gilbert Community College, Emerging Science & Math Scholars, Certificate of Recognition for Outstanding Student Support Award 2017, 2016, 2015
- ASEE 2015 National Conference, Best Presentation Award, Freshman Programs Division
TRiO Academic Achievement Award 2015
- ASEE 2014 National Conference, Best Presentation Award, Freshman Programs Division
- Arizona State University Graduate Fellowship Award 2013
- Central Arizona Project Award for Research 2012
- Arizona Water Association 2012 Annual Conference Best Research Abstract
- Arizona Water Association Academic Scholarship Recipient 2012
- Ira A. Fulton School of Engineering Dean's Fellowship Recipient 2008-2009
- Boise State University Outstanding Graduating Senior May 2001
- ASBSU Hall of Fame Award for Outstanding Leadership in Student Organizations 2000

TEACHING APPOINTMENTS

California Polytechnic State University, San Luis Obispo

Assistant Professor, Construction Management Department, September 2023 - Present

CM314, Heavy Civil Construction Management - Materials, methods, and techniques associated with civil engineering projects and heavy construction operations. Topics include tunnel, bridge, dam, and road construction; equipment selection; and temporary structures. Scheduling, estimating, and construction contracts are integrated into a project based approach.

ARCE211, Structures I - Introduction to the role of structures in the making of buildings. Introduction to statics and creation of simple three-dimensional structures. Development of skills to analyze structures composed of axial force (truss) members.

ARCE212, Structures II - Introduction to the role of structures in the making of buildings. Introduction to shear and moment diagrams using the principles of statics and the application of the diagrams to simple three-dimensional structures. Development of skills, particularly free body diagrams, to analyze structures composed of bending (beams) members.

Cuesta College, San Luis Obispo, California

Engineering Instructor (tenured) Engineering and Technology Division, August 2022- May 2023

Service positions/duties include: NSF ENGAGE Scholarship Program Director, ENGR Dual enrollment coordinator

ENGR248, Introduction to Engineering - This course introduces first-year engineering students to the duties, responsibilities, and areas of expertise of engineering professionals; guides them to analyze issues using engineering ethics; has them apply engineering teamwork skills and the engineering design process in group projects; and has them identify and describe academic pathways to achieve their educational goals.

ENGR250, Statics - Engineering mechanics course which covers principles of analysis for rigid bodies in static equilibrium when acted upon by forces and couples in two- and three dimensional space. Material covered includes the equilibrium of rigid bodies, trusses, frames, and machines, as well as calculations of centers of mass, centroids, distributed loads, friction, and moments of inertia.

ENGR252A, Strength of Materials I – Engineering mechanics course which studies stresses, strains, and deformations associated with axial, torsional, and flexural loading of bars, shafts, and beams. Includes analysis of elementary determinate and indeterminate mechanical and structural systems.

ENGR252B, Strength of Materials II – Engineering mechanics course which studies stress and strain transformations, analysis of beam deflection and rotation, indeterminate beams, and column buckling.

Fresno City College, Fresno, California

Engineering Instructor (tenured) Math, Science, and Engineering Division, August 2017- May 2022

Service positions/duties include Engineering Curriculum Pathways and Transfer Document

Development, Engineers' Week Outreach Co-coordinator, Society of Women Engineers Club Faculty Advisor, Engineering Program Advisory Board Co-coordinator, Campus Safe Space Program Coordinator.

ENGR10, Introduction to Engineering - This course introduces first-year engineering students to the duties, responsibilities, and areas of expertise of engineering professionals; guides them to analyze issues using engineering ethics; has them apply engineering teamwork skills and the engineering design process in group projects; and has them identify and describe academic pathways to achieve their

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educational goals. I was able to redesign this course at Fresno City College to be offered as a lecture + lab course in 2018. Since then other colleges within the District have followed suit to do the same.

ENGR1A, Introductory Plane Surveying – An introductory land surveying course with a laboratory. The course covers principles and practice of surveying measurements, computation, and data analysis. Principles covered include measurement of distance, angles and direction; error analysis; earthwork; horizontal and vertical curves; and topographic mapping. The course includes field surveys using total stations, automatic levels, and survey grade Global Positioning System (GPS) receivers.

ENGR2, Engineering Graphics – Engineering graphics and design drawings. The course covers hand sketching and SolidWorks to explore principles of orthographic and axonometric projection, sketching, dimensioning, and tolerances; computer aided design (CAD), and its application to the solution of engineering problems. Students build upon their knowledge and experience with teamwork and engineering design to work on both individual and group assignments to prepare them for success in future engineering courses and the modern engineering workplace.

ENGR4, Materials Science and Engineering – Introductory materials science and engineering course. During the semester, we cover properties of engineering materials and their relation to atomic structure; the effect of microstructure on the mechanical, electrical, magnetic and thermal properties of materials; and phase equilibria and strengthening processes for metals, ceramics, and polymers.

ENGR8, Engineering Statics – Engineering mechanics course which covers principles of analysis for rigid bodies in static equilibrium when acted upon by forces and couples in two- and three-dimensional space. Material covered includes the equilibrium of rigid bodies, trusses, frames, and machines, as well as calculations of centers of mass, centroids, distributed loads, friction, and moments of inertia.

Chandler-Gilbert Community College, Chandler, Arizona

Residential Engineering Faculty (tenure track) Physical Science and Engineering Division, August 2014-May 2017

Service positions held: Joint MCCC/ASU Engineering Education Task Force Representative, Engineering Club Faculty Advisor, Engineering Academic Advisor, and STEM Outreach Coordinator

ECE 102, Engineering Analysis Tools and Techniques – This course is designed to introduce first year engineering students to engineering disciplines, design processes and techniques. Students are instructed in the use of Microsoft Excel as an engineering computational and graphics tool. A primary objective of this course is to generate and fuel interest and excitement about futures in engineering. Course materials I have developed include multiple active and experiential learning modules on engineering design, group presentations requiring independent research, hands-on design/build projects, as well as essay-writing activities on salient engineering topics.

ECE 103, Engineering Problem Solving and Design – This course builds upon outcomes achieved in ECE102 and further explores the engineering design process, modeling, as well as communication and problem solving in a team environment. The computer software focus in this course is on MATLAB and SolidWorks. Course materials that I have developed are constantly updated and include experiential learning modules on sustainability, engineering ethics, team research and design projects.

ECE 216, Computer Aided Engineering – This course is an introduction to engineering graphics and design drawings. We use SolidWorks to explore orthographic projection, dimensioning, sectioning, tolerancing, assembly drawings, and pictorial drawings. Students build upon knowledge and experience with teamwork and engineering design to work on both individual and group assignments to prepare for success in future engineering courses and the modern engineering workplace.

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ECE 294, Special Topics in Engineering, Infrastructure – Through ongoing work with CIT-E collaborators I was able to bring a 2-credit version of this course to CGCC. The course is designed to teach students to a) define and describe the components of an infrastructure system and their functions, b) analyze and propose solutions to ill-defined infrastructure problems, c) describe the influence of political, social, technological, environmental and economic factors on infrastructure decisions, d) identify ethical questions regarding infrastructure development and repair, and e) explain how infrastructure solutions affect society, the environment, and budgets.

ECE298, Engineering Special Projects – In the Fall 2015 session I mentored two students through a hands-on Slow Sand Water Filtration research project, working with the Geology department and the Environmental Technology Center. This project experience culminated with a student delivered technical presentation at the CGCC Math and Science Honors Colloquium.

Arizona State University, Tempe, Arizona

Faculty Associate, Honors Faculty Ira A Fulton Schools of Engineering, August 2013-August 2014

FSE 100, Introduction to Engineering – A two-credit freshman course required for all for all engineering majors. Learning objectives include establishing familiarity with tools and software used in engineering and learning how to work effectively in teams and recognize the value of teamwork. Introduced a novel module for teaching teamwork that speaks to the whole student – cognitively, affectively, and conatively. Conation describes a person's natural striving instincts, or volition.

CEE300, Engineering Business Practices – A three-credit course covering engineering economics and engineering professionalism. Learning outcomes focus on teamwork, leadership, communications skills (written and oral), ethics, understanding engineering in a global context, and mathematical problem-solving related to engineering finance.

Mesa Community College, Mesa, Arizona

Adjunct Engineering Faculty Physical Science Department, August 2010-August 2014

ECE 102, Engineering Analysis Tools and Techniques – This course is designed to teach first-year engineering students fundamental skill sets that will be used throughout their educational and professional careers, specifically focusing on teamwork, analytical problem solving and computer modeling using MATLAB computer software.

ECE 201, Introduction to Engineering Statics, and Laboratory – This course is an introduction to engineering statics, including force systems, resultants, equilibrium of particles and rigid bodies. The course also introduces centroids and centers of mass, area moments of inertia, and distributed loading.

GRANTS

Current Projects:

Co-Principal Investigator. Collaborative Research - ENGAGE: Engineering Neighbors -- Gaining Access, Growing Engineers. NSF SSTEM (\$5M award; \$1.2M Subaward to Cuesta College). This five year project is designed to increase diversity at Cal Poly SLO by enhancing the pipeline from two local community colleges, Cuesta College and Allan Hancock Community College, to Cal Poly's College of Engineering. The grant was created to increase access to engineering careers for low income, academically talented students with a demonstrated financial need. I took over the PI role at Cuesta in the final year of the grant. (September 2022 – June 2023)

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Previous Projects:

Principal Investigator. Enhancing the Transfer Experience through a Collaborative Cohort Program for Fresno City College Engineering Scholars. NSF SSTEM (\$700,000). This five-year project aims to contribute to the national need for well-educated engineers by increasing degree completion and transfer rates of low-income, high-achieving engineering undergraduates. The project includes an educational research plan to determine factors that influence student identity and sense of belonging in STEM. (March 2019 – February 2024)

Senior Personnel. Supporting Active Learning in Introductory STEM Courses with Extended Reality. NSF HSI (\$1M). This three-year project is a collaboration between three California State University campuses (Fresno, San Jose, and Sonoma) and Fresno City College which aims to provide training for 30 STEM educators in active learning utilizing extended reality (XR) technologies (i.e. virtual reality, augmented reality, and mixed reality technologies). The project research plan will generate new knowledge about faculty implementation of XR technologies and the impact on student learning outcomes. (October 2021 – September 2024)

Co-Project Lead. Fresno City College Makerspace Development. Chevron (\$125,000). Through this project FCC engineering faculty are creating a new maker space on campus to enrich existing engineering courses with the incorporation of new hands-on activities and to enhance outreach programs with local high schools. (December 2021 - December 2022)

Co-Project Lead. Women in Engineering Day. Chevron (\$75,000). This project engages high school girls in an annual Women in Engineering Day event at Fresno City College. Freshman girls enrolled in advanced math from Fresno Unified School District high schools will be invited for a day of engineering during which they will engage in hands on engineering workshops designed to introduce them to career opportunities in geomatics and mechanical engineering. (October 2019 – October 2022)

Project Director. Faculty Directed Undergraduate Research. NSF Western Alliance to Expand Student Opportunities WAESO (\$4,300). Phase 2 of this project provides an undergraduate research approach to address GIS mapping needs at the Chandler-Gilbert Community College one-acre Environmental Technology Center. (August 2016 – June 2017)

Co - Principal Investigator. Integrating Freshman Engineering and US History to Increase Persistence of Underrepresented Minority Students in Engineering. Maricopa Center for Learning and Instruction (\$5,115). This project includes the development of scalable model for implementing learning community curriculum that combines an Introduction to Engineering course and a US History course to aid programs in introducing students to fundamental concepts in engineering while highlighting how engineering decisions and achievements have influenced history in the United States. (July 2016 – July 2017)

Senior Personnel. Collaborative Research: Training Next Generation Faculty and Students to Address the Infrastructure Crisis NSF TUES2 (\$360,000). Funding supports collaboration amongst eight Universities to incorporate civil infrastructure (i.e. “public works”) content into undergraduate curriculum.

Incorporation will be achieved through the addition of infrastructure systems courses to the curriculum as well as the addition of infrastructure content into existing courses. (June 2013 – May 2017)

Senior Personnel. Integrating Sustainability Grand Challenges and Experiential Learning into Engineering Curricula. NSF TUES2 (\$600,000). This grant funds collaboration between multiple Universities and Community Colleges for the development and classroom implementation of new active and experiential learning modules. (September 2013 – August 2017)

Project Director. Faculty Directed Undergraduate Research. NSF Western Alliance to Expand Student Opportunities WAESO (\$3,300). This provides an undergraduate research approach to address GIS mapping needs at the Chandler-Gilbert Community College one-acre Environmental

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Technology Center. (August 2016 – December 2016)

Research Experience for Teachers. Solar Energy Research Experience for Teachers. Quantum Energy & Sustainable Solar Technologies (QESST) A NSF/DOE Engineering Research Center. An intensive five-week research experience for K-12 and community college faculty at ASU's Solar

Power Laboratories (\$5,200) (May 2016 – July 2016)

Research Experience for Teachers. Cross-disciplinary Education in Social & Ethical Aspects of Nanotechnology at Arizona State University. The project explores novel methods for engaging students from multiple disciplines in deliberating the social dimensions of emerging nanotechnologies. NSF NUE (\$10,000) (October 2015 – July 2016)

Principal Investigator. Improving Teamwork Skills in Freshman Engineering Students through Conative Understanding. Student Learning Outcomes and Assessment Committee (\$5,200). Funding supports instinct based module delivery in seven freshman engineering classes and assessments for 175 students to improve teamwork skills on research and design projects.

(August 2015 – August 2016)

Co-Principal Investigator. STEM Foundations: Concepts of Engineering, Physics and Mathematics in a Linked Learning Community. Maricopa Center for Learning and Instruction (\$4,000). This project includes the development and delivery of a linked learning community at Chandler-Gilbert Community College between an introductory engineering course (ECE103), a second semester calculus course (MAT230) and a first semester physics course (PHY121). (July 2015 – August 2016)

Co-Principal Investigator. Integrating Sustainability Grand Challenges via Experiential Learning Labs. Graduate Interdisciplinary Studies Educational Research (GISER) (\$500). GISER funding was utilized to obtain materials for use in the classroom for implementing new active and experiential learning modules developed under separate projects.

Senior Personnel. ASU Tooker Professors grant, Thematic Active Learning Modules (TAMs) for Engineering Curriculum. Arizona State University (\$74,000) (. This project has funded collaboration amongst educators from different institutions in the development of multiple TAMs. September 2012-August 2014)

Principal Investigator. Improving learning productivity and teamwork skills in freshman engineering students through conative understanding. Center for Conative Abilities. (\$31,200). This project involves evaluation of students' instinctive behavioral strengths using online Kolbe A™ assessments. Student results are analyzed and discussed in the classroom through a series of ungraded team-based activities. This understanding is then used to form teams of complementary skill sets for semester projects. (September 2013 – August 2014)

Graduate Research Assistant. Energy and Water in the Western and Texas Interconnects. U.S. Department of Energy. (\$62,500) (*Dissertation funding*). Used for analysis of water consumption and virtual water trade in energy resources in the Western U.S. in collaboration with Sandia National Laboratories and the Department of Energy.

Declined Proposals:

Co-Principal Investigator. Inclusive Educational Strategies Deployment NSF INCLUDES (\$300,000) This proposal provides a scalable model for addressing the pedagogical barriers of unintended classroom biases in course materials and their delivery in civil & environmental engineering (CEE) educational settings.

Senior Personnel. Resilient Scholars for Resilient Cities (RSRC) NSF (\$300,000). This project proposed an 8-week summer research experience for undergraduates (REU) in the emerging field of Resilient Infrastructure. In addition to technical training, RSRC scholars would receive mentoring in

communication skills, system-thinking, teamwork, and research ethics. Senior Personnel. Transforming Engineering Education through Conative Awareness NSF ECR (\$300,000). This three year project proposes a longitudinal study of the effectiveness of incorporating instinctive behavioral learning modules into civil engineering curriculum by integrating evidence-based knowledge of conation and teamwork throughout the four years of an engineering students' experience to support STEM learning and better prepare the engineering workforce for the 21st Century.

Senior Personnel. Improving problem-solving strategies through self-regulated learning practices at community colleges NSF ATE (\$900,000). This three-year project involves collaboration between multiple institutions to assess and improve learning in community college classes. The aim is to conduct research to better understand and enhance learning through problem-solving processes among community college students, and to integrate educational activities and faculty professional development activities to effectively teach these skills in the community college classrooms.

Co-Principal Investigator. Young Arizona Engineering Students *CAN* be what they see, ASU Women in Philanthropy (\$60,000). The project proposed to develop a tiered recruitment and mentoring program run by female engineering faculty and ASU students as real-life examples of what students *can be*; successful engineers from a diverse socioeconomic background. The aim is to excite and encourage future young engineers in local middle and high schools through the use of active learning in local science classrooms.

PRESENTATIONS, POSTERS, AND INVITED TALKS

*student advisees underlined

Adams, Elizabeth. (2023) "Fresno City College Engineering Scholars Program" Best Practices and Innovations for S-STEM Student Success at Minority Serving Institutions, AAAS S-STEM Resource and Evaluation Center Capacity Building at MSIs Webinar Series. April 6, 2023.

Figueroa, Melissa, Elizabeth Adams, Yaqeline Castro, and Noopur Jain. (2021) "Mentoring and Developing the next generation of High-Speed Rail Workforce" Panel Presentation at WTS Virtual Annual Conference. April 19, 2021.

Adams, Elizabeth, Yushin Ahn, Claire Dancz, and Carol Haden. (2021). "Enhancing the Transfer Experience through a Collaborative Cohort Program for Fresno City College Engineering Scholars" Video presentation at AAAS 2021 Virtual S-STEM Fall Forum.

Adams, E. A., Haden, C., Dancz, C. L. A., Ahn, Y., and Willis, K. (2021, July), "Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Engineering Scholars Program at a Two-Year College: Preliminary Interventions and Outcomes" Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference.
<https://peer.asee.org/37700>

Ankrum, Addison, John Heathcote, and Elizabeth Adams. (2020). "Feasibility Test of Smart Traffic Lights in Small Cities." Research Poster. Thirteenth Annual Community College Honors Research Symposium. Online format due to COVID-19.

Adams, Elizabeth and Colleen Bronner. (2019). "Safe Zone LGBTQ+ Ally Training, Level 2 Workshop." Facilitated workshop at Society of Women Engineers Annual Conference, WE19, Anaheim, California, November 8, 2019.

Adams, Elizabeth. (2017). Invited talk. "LGBTQ Inclusion in Engineering." Presentation given at California State University, Fresno, American Society of Civil Engineers Annual Banquet, Fresno, California, November 16, 2017.

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Adams, Elizabeth, Christopher Carr, and Alex Meija. (2017). "Safe Zone LGBTQ+ Ally Training, Level 1 Workshop." Facilitated workshop at 124th American Society for Engineering Education Annual Conference and Exposition, Columbus, Ohio, June 28, 2017.

Meraban, Amir, Elizabeth Adams, and Sujatha Krishnaswamy. (2017). "Using Principles of Green Chemistry and Green Engineering to Guide the Development of a Systematic Approach for Mitigating Polymer-based Pollution." Research Poster. American Society for Engineering Education Pacific Southwest Section Conference, Tempe Mission Palms, Tempe, Arizona | April 20-22, 2017

Richardson, Kayla, Mario Jacquez, Ayanna Harris, Roseanne Navarro, Charles Poure, and Elizabeth Adams. (2017). "Using GIS for Mapping and Facilities Development: Analysis of Campus Traffic Modifications." Research Poster. Twelfth Annual Arizona Western Alliance to Expand Student Opportunities Student Research Conference. Arizona State University, Tempe, AZ. March 15, 2017.

Harris, Ayanna, Roseanne Navarro, Kayla Richardson, Mario Jacquez, Charles Poure, and Elizabeth Adams. (2017). "Using GIS for Mapping and Facilities Development: Analysis of Campus Revegetation impact on Urban Heat Island Effect." Research Poster. Twelfth Annual Arizona Western Alliance to Expand Student Opportunities Student Research Conference. Arizona State University, Tempe, AZ. March 15, 2017.

Dancz, Claire L. A., Kevin J. Ketchman, Rebekah D. Burke, Roksana Mahmud, Melissa M. Bilec, Elizabeth A. Adams, Kristen Parrish, Braden Allenby, Vikas Khanna, and Amy E. Landis. (2016). *Integrating Sustainability Grand Challenges and Experiential Learning into Engineering Curricula: Years 1 through 3*. American Society for Engineering Education, June 26-29, 2016 New Orleans, LA.

McBurnett, Lauren, Elizabeth Adams, Philip Parker, and Thomas Seager (2016). "Center for Infrastructure Transformation and Education (CIT-E): Prepare Students for the 21st Century Infrastructure Crisis." Envisioning the Future of Undergraduate STEM Education: Research and Practice Symposium Presentation. Washington DC. April 28, 2016.

Claire Louise Antaya Dancz, Kevin Ketchman, Rebekah Burke, Melissa Bilec, Elizabeth Adams, Braden Allenby, Mikhail Chester, Vikas Khanna, Kristen Parrish, Thomas Seager, Amy E. Landis (2016). "Integrating Sustainability into Engineering and Construction Curricula through Modular and Course-based Methods" OnSustainability Conference Presentation, Portland, OR, January 22, 2016.

Smith, Logan F., Adams, Elizabeth A., Ruddell, Benjamin L. *Embedded Resource Accounting; an application to water embedded in the production and trade of agriculture and energy in the Western U.S.* Arizona Water Research Workshop Poster. Transforming Research into Practice. Salt River Project, PERA Club, Tempe, Arizona, January 15, 2014.

Smith, Logan and Elizabeth A. Adams, *Embedded Water Trade in Agricultural Products*. Fulton Undergraduate Research Initiative (FURI) Symposium Poster, Arizona State University, Tempe, Arizona, November 22, 2013.

Adams, Elizabeth A., *Sustainable Engineering: A Field in Transition*. Environmental Engineering Seminar Presentation for the School of Sustainable Engineering and the Built Environment, Arizona State University, Tempe, Arizona, October 29, 2013.

Seager, Thomas P, Adams, Elizabeth A., and Vortherms, Kaitlin. *Conation in Leadership*. Presentation and workshop given for the Arizona State University Global Institute of Sustainability (GIOS) Lightworks Leadership Academy, Tempe, Arizona, October 25, 2013.

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- Antaya (Dancz), C.L., Bilec, M., Adams, Elizabeth A., Barr, W. *Integrating Sustainability Concepts in Introduction to Engineering through Active and Experiential Learning*. National Technical Association Conference Presentation, September 19-21, 2013 Dayton, Ohio.
- Seager, Thomas P, and Adams, Elizabeth A. *Conation and Team Science*. Presentation and workshop given for the Arizona State University Consortium for Science, Policy and Outcomes (CSPO) Retreat, Tempe, Arizona, August 21, 2013.
- Adams, Elizabeth A., *An analysis of water embedded in electricity trade in the Western U.S.* Presentation given at Arizona Water Association 86th Annual Conference, Glendale, Arizona, May 3, 2013.
- Adams, Elizabeth A., and Ruddell, Benjamin L. *Embedded Resource Accounting: An application to water embedded in the Western U.S. electrical energy trade*. Poster and Presentation at Arizona State University School of Sustainable Engineering and the Built Environment Graduate Research Symposium, Tempe, Arizona, March 7, 2013.
- Martin (Adams), Elizabeth A. *An Experiential Pedagogy for Sustainability Ethics*. Presentation given at 119th American Society for Engineering Education Annual Conference and Exposition, San Antonio, Texas. June 11, 2012.
- Martin (Adams), Elizabeth A., and Ruddell, Benjamin L. *Value Intensity of Water used for Electrical Energy Generation in the Western U.S.; An Application of Embedded Resource Accounting*. Presentation given at Arizona Water Association 85th Annual Conference, Glendale, Arizona. May 3, 2012.
- Martin (Adams), Elizabeth A., and Ruddell, Benjamin L. *Embedded Resource Accounting: An analysis of water and energy resources in the western U.S.* Poster presented at CAP LTER 14th Annual Poster Symposium and All Scientists Meeting, Arizona State University Skysong, Scottsdale, AZ. January 13, 2012.

PUBLICATIONS

Peer Reviewed Journal Articles

- Ruddell, B. L., E. A. Adams, R. Rushforth, and V. C. Tidwell (2014), Embedded resource accounting for coupled natural-human systems: An application to water resource impacts of the western U.S. electrical energy trade, *Water Resources Research*, 50, 7957–7972, doi:10.1002/2013WR014531.
- Rushforth, Richard R., Adams, Elizabeth A., and Ruddell, Benjamin L., (2013) Embedded Resource Accounting: Generalizing Ecological, Water and Carbon Footprint Methodologies. *Water Resources and Industry* (1-2), 77-90.
- Sadowski, Jathan, Seager, Thomas P., Selinger, Evan, Spierre, Susan G., Adams, Elizabeth A., Berardy, Andrew (2014) Collective Action, Evolution, and Intergroup Cooperation. *Science and Engineering Ethics*. doi: 10.1007/s11948-014-9575-3.

Refereed Conference Publications

- Adams, E. A., Haden, C., Dancz, C. L. A., Ahn, Y., and Willis, K. (2021, July), *Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) Engineering Scholars Program at a Two Year College: Preliminary Interventions and Outcomes* Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. <https://peer.asee.org/37700>
- Dancz, C. L. A., Adams, E. A., Haden, C., Ahn, Y., Willis, K., and Craig, D. (2021, July), *Implementation of a Guided Mentorship Program in a STEM Community of Practice at a Two-Year College* Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. <https://peer.asee.org/37296>

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- Adams, Elizabeth and Mary Beth Burgoyne (2017). "An Evidence Based Practice: Integrating Humanitarian Engineering Design Projects to Increase Retention of Underrepresented Minority Students and to Achieve Interpersonal Skill Related Learning Outcomes." American Society for Engineering Education, June 25-28, 2017 Columbus, Ohio.
- McBurnett, Lauren, Elizabeth Adams, Philip Parker, and Thomas Seager (2016). "Center for Infrastructure Transformation and Education (CIT-E): Prepare Students for the 21st Century Infrastructure Crisis." Envisioning the Future of Undergraduate STEM Education: NSF & AAAS Research and Practice Symposium. Washington DC. Conference Paper.
- Dancz, Claire L. A., Kevin J. Ketchman, Rebekah D. Burke, Roksana Mahmud, Melissa M. Bilec, Elizabeth A. Adams, Kristen Parrish, Braden Allenby, Vikas Khanna and Amy E. Landis. (2016). "Integrating Sustainability Grand Challenges and Experiential Learning into Engineering Curricula: Years 1 through 3." American Society for Engineering Education, June 26-29, 2016 New Orleans, LA.
- Dancz, Claire L. Antaya, Kevin J. Ketchman, Rebekah Burke, Melissa M. Bilec, Elizabeth A. Adams, Braden Allenby, Mikhail Chester, Vikas Khanna, Kristen Parrish, Thomas P. Seager, and Amy E. Landis. (2015). "Integrating Sustainability Grand Challenges and Experiential Learning into Engineering Curricula: Years 1 and 2." American Society for Engineering Education, June 14-17, 2015 Seattle, WA.
- Adams, Elizabeth A., Claire L. Antaya Dancz, and Amy E. Landis. (2015). "Improving engineering student preparedness, persistence, and diversity through conative understanding." American Society for Engineering Education, June 14-17, 2015 Seattle, WA.
- Adams, Elizabeth A., Antaya, Claire L., Seager, Thomas P., Landis, Amy E. (2014). "Improving learning productivity and teamwork skills in freshman engineering students through conative understanding" American Society for Engineering Education, June 15-18, 2014 Indianapolis, IN.
- Antaya, Claire L., Adams, Elizabeth A., Bilec, Melissa, Landis, Amy E. (2014). "Impact on Learning Outcomes Case Study: Introduction to Engineering course exposed to an Active and Experiential Learning Module versus Introduction to Engineering Control Group" American Society for Engineering Education June 15-18, 2014 Indianapolis, IN.
- Antaya, Claire L., Adams, Elizabeth A., Bilec, Melissa, Parrish, Kristen, Khanna, Vikas, Chester, Mikhail, Seager, Thomas and Landis, Amy E. (2014). "Integrating Sustainability Grand Challenges and Experiential Learning into Engineering Curricula: a TUES2 collaborative research project" American Society for Engineering Education, June 15-18, 2014 Indianapolis, IN.
- Antaya, Claire L., Bilec, Melissa, Adams, Elizabeth A., Barr, William and Amy E. Landis. (2013). "Integrating Sustainability Concepts in Introduction to Engineering through Active and Experiential Learning." National Technical Association Conference Paper, September 19-21, 2013 Dayton, Ohio.
- Claire L. Antaya, Elizabeth A. Adams, Susan Spierre Clark, Thomas P. Seager and Amy E. Landis. (2013). "Using Conation to Enhance Student Satisfaction with Teams in SOS 110." National Technical Association, September 24-26, 2013 Cleveland, OH.
- Antaya, Claire, Parrish, Kristen, Adams, Elizabeth A., Landis, Amy E. (2013). "Experiential Learning in the Civil Engineering Curriculum: Collaborations between Community Colleges, Research I Universities and National Laboratories." American Society for Engineering Education, June 23 - 26, 2013 Atlanta, GA.
- Martin (Adams), Elizabeth A., and Benjamin L. Ruddell. (2012) "Value Intensity of Water used for Electrical Energy Generation in the Western U.S.; An Application of Embedded Resource Accounting."

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Proceedings of IEEE International Symposium on Sustainable Systems and Technology, Conference Paper. Boston, Mass. May 2012.

Spierre, Susan; Martin (Adams), Elizabeth A.; Sadowski, Jathan; Berardy, Andrew; McClintock, Scott; Augustin, Shirley-Ann; Hohman, Nicholas; Banna, Jay. "An Experiential Pedagogy for Sustainability Ethics." 119th American Society of Engineering Education Annual Conference and Exposition, Conference Paper, San Antonio, Texas, June 2012.

Spierre, Susan; Seager, Thomas; Selinger, Evan; Sadowski, Jathan; Martin (Adams), Elizabeth A. "Sustainability Ethics Education Using Non-Cooperative Games." International Mechanical Engineering Congress and Exposition, Conference Paper, November 2011.

PROFESSIONAL ENGINEERING EXPERIENCE (an excerpt)

Sr. Construction Engineer, 2006-2007, *Washington Group International, Boise, Idaho.*

State Highway U.S. 30, McCammon to Lava Hot Springs Corridor project for the Idaho Transportation Department, Bannock County, Idaho. Served as an associate project manager and project engineer on multiple segments of this project. Two segments in the final design phase (\$4.7M) and one under construction (\$21.6M).

Project Manager, 2004-2006 *CH2M HILL, Honolulu, Hawaii.*

Infrastructure Repair and Replacement; Air Force Center for Environmental Excellence; Kadena Air Base, Okinawa, Japan. As the project manager, managed financial and technical aspects of this \$1.6M project. The project included a water line loop replacement on the flight line, several transformer replacements on the Base and street light repairs and replacements.

Replace Three Sanitary Sewer Lift Stations; Air Force Center for Environmental Excellence; Kadena Air Base, Okinawa, Japan. As the project manager, managed the financial and technical aspects of the project to ensure that quality was provided in each step. Assisted with work plan development as well as playing a key role in equipment and subcontractor procurement.

Project Engineer, 1999-2004, *CH2M HILL, Boise, Idaho.*

Backflow Prevention Survey; Air Force Center for Environmental Excellence; Kadena Air Base, Okinawa, Japan. As the site task engineer, performed a backflow survey of Kadena AB over an eleven-week period, managing a backflow prevention subcontractor on site. Liaised with military personnel and government project managers to accomplish the survey of approximately 250 facilities on KAB. Compiled data gathered during the survey, and prepared final report which included a Microsoft Access based Cross Connection Control database.

Stormwater Treatment Facility; Ada County Highway District; Boise, Idaho. As a project engineer, worked closely with the project manager to design a facility for re-use of water collected from storm sewers and street sweeping operations. The facility consists of a decant/sediment basin and sand filter for water treatment. Subsequently assisted with water quality monitoring and sampling activities at the facility. *(Master's Thesis research)*

Engineering Services; Northwest Boise Sewer District; Boise, Idaho. Served as Assistant District Engineer. Attended District Board meetings and handled various correspondences with District customers and contractors. Served as the Pretreatment Coordinator for the District, performing inspections and maintaining communication between the District and their commercial users to ensure compliance with federal, state, and local pretreatment regulations.