Evan Alexander Beirne Thomas
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Education

PhD	2009	Aerospace Engineering Sciences (Bioastronautics), University of Colorado at Boulder *Sustainable Fouling Management for Spacecraft Fluid Handling Systems*
MBA	2022	Global Masters of Business Administration, Fletcher School, Tufts University
MPH	2014	Masters in Public Health, Oregon Health and Science University
MS	2006	Aerospace Engineering Sciences (Bioastronautics), University of Colorado at Boulder *Feasibility of a Modulated Diode Laser for Crewed Spacecraft Fire Detection*
BS	2006	Aerospace Engineering Sciences, University of Colorado at Boulder *Editor in Chief 2002-2005: Colorado Engineer Magazine*
BS	2006	Broadcast Journalism (Honors), University of Colorado at Boulder

Licensure

PE Environmental Engineering, license number 106345, State of Texas, 2010

Employment History

1. Professor, Dept. of Civil, Environmental and Architectural Engineering, University of Colorado Boulder (2022-Present, Associate Professor 2018-2022)
   - Mortenson Endowed Chair in Global Engineering, Director, Mortenson Center in Global Engineering and Resilience (2018-Present)
   - Joint appointment, Aerospace Engineering Sciences Department (2018-Present)
   - Director, Climate Innovation Collaboratory
   - Courtesy appointment, Department of Environmental and Occupational Health, Colorado School of Public Health (2018-Present)

2. Associate Professor, Mechanical and Materials Eng. Dept., Portland State University (2016-2018), Assistant Professor 2010-2016)
   - Courtesy appointment, OHSU-PSU School of Public Health (2017-2018)
   - Director, Sustainable Water, Energy and Environmental Technologies Laboratory, (2010 – 2018)
   - Faculty Fellow, Institute for Sustainable Solutions, Portland State University, (2011 – 2018)

3. Chief Executive Officer, Founder, Virridy (formerly SweetSense Inc.), (2012 – Present)

4. Chief Operating Officer, DelAgua Health, (2012 – 2016)

5. Executive Vice President, Co-Founder, Manna Energy Limited, (2007 – 2013)

6. Aerospace Engineer, NASA Johnson Space Center, (2004 – 2010)

Honors and Awards

National / International

- Association of Environmental Engineering and Science Professors (ASEEP) - 2023 Steven K. Dentel Award for Global Outreach
- Million Lives Club, Vanguard, 2021 (for Drought Resilience Impact Platform)
- San Francisco Design Week, Internet of Things First Prize, 2021
- Finalist, Canadian Astronaut Selection, 2017

University of Colorado / Portland State University

- Research and Innovation Faculty Fellows, 2022
- Faculty Leadership Institute, 2021
- Civil, Environmental and Architectural Engineering Dept Research Development Award, 2021
- Mortenson Endowed Chair in Global Engineering, University of Colorado Boulder, 2018-Present
- University of Colorado at Boulder Kalpana Chawla Outstanding Recent Alumni Award, 2015
- University of Colorado at Boulder College of Engineering Recent Alumni Award, 2015
- Portland State Impact Entrepreneurs Entrepreneurship Award, 2014
- Named one of 25 Global Game Changers, Portland Monthly, 2013
- Civic Engagement Award, Excellence in Community-Based Research, Portland State, 2011

Fellowships

- Rockefeller Foundation Bellagio Center Residency Fellowship, 2015
- NASA Johnson Space Center Fellowship, 2008-2009

Research Funding

My work has been funded by the National Science Foundation, NASA, USAID, USDA, the Millennium Challenge Corporation, Deloitte, Chemonics, the Wellspring Foundation, the Moore Foundation, and the Autodesk Foundation. Since arriving at CU Boulder in July 2018, I have secured over $15 million dollars in grants and contracts, with over $14.1 million as PI. Separately, I have secured over $9.5 million dollars of investment in my company, Virridy.

Professionally Related Service

Department / Center / College

- Director, Mortenson Center in Global Engineering, 2018-Present
- Director, The Climate Innovation Collaboratory, 2021-Present

University

- Presidential Search Committee Member, Portland State University, 2016-2017
- Lead, Graduate Certificate in Global Health Proposal, Oregon Health and Science University, Portland State University School of Public Health, 2017-2018
- Co-Chair, Internationalization Topic, Portland State Strategic Plan Development, 2016
- School of Public Health Dean Search Committee Member, OHSU/PSU, 2016

- Member, Research Advisory Committee, Portland State University, 2013 - 2016

Professional

- Board, Executive Committee member, Millennium Water Alliance, 2020-Present
- Co-Chair, American Society of Mechanical Engineering – Engineering for Change Research Committee, 2019-Present
- Guest Editor, Special Issue on *Global Engineering and Sustainable Development*, Sustainability, 2019 - Present
- Guest Editor, Special Issue on "Internet of Things, Remote Sensing and Analytics to Support Distributed Monitoring and Management of Water, Sanitation, Agricultural and Energy Resources in Remote and Low Income Regions," Sustainability, 2019 - Present
- Associate Editor, Journal of Development Engineering, Elsevier Journals, 2014-Present
- Grand Challenges Canada Review Panel, 2017
- National Science Foundation SBIR Panel, 2016
- NASA SBIR Panel, 2015
- Founding Member, Ashoka Changemakers Campus Committee, 2012 - 2014
- Member, AIAA Life Sciences and Systems Technical Committee, 2009 – 2013
- Member, American Society of Mechanical Engineers**,** 2015 – Present
- Member, American Society of Environmental Engineering Professors, 2019-Present

Patents (advisees noted in italics)

P-1. Neff, J., Whiting, G., **Thomas, E.,** An integrated system for the detection and monitoring of soil carbon sequestration, US Patent Pending.

P-2. **Thomas, E.,** *Sharpe, T., Bedell, E.,* Alarm Threshold Microbial Fluorimeter and Methods, US Patent Pending US Serial No. 62/843,860.

P-3. Wilson, D., Coyle, J., **Thomas., E.,** Machine Learning Techniques for Improved Water Service Delivery, US Patent Pending US Serial No. 62/843,836.

P-4. Fleming, M., Spiller, K., **Thomas, E.,** System and Methods for Operating a Microcomputer in Sleep-Mode and Awake-Mode with Low Power Event Processing, United States Patent US 10,564,701. Issued Feb. 18, 2020.

P-5. **Thomas,** E, Fleming, M., Spiller, W., Chan. C., *Zumr, Z.* Distributed low-power monitoring system, United States Patent US 9,077,783 B2, Issued July 7, 2015.

P-6. Weislogel, M., **Thomas, E.,** Graf, J., Systems and Methods for Separating a Multiphase Fluid, United States Patent US 7,905,946 B1, issued March 15,2011.

P-7. Gold, M., **Thomas, E.,** Bring Your Own Water Treatment System United States Patent US 8,002,993 B2, issued August 23, 2011.

Books

B–1. Demaree, K., Holland, H., Kremen, A., **Thomas, E.,** Emerging Technologies to Improve Water Resource Management in Colorado, Mortenson Center in Global Engineering, Colorado Water Center. 2022.

B–2. Sweeney, D., Gandhi, A., **Thomas, E., "**Ethical considerations for "Internet of Things" in research to advance global development," *in* Handbook of Innovation & Appropriate Technologies for International Development. Edward Elgar Publishing, 2022.

B–3. **Thomas, E,** The Global Engineers – Building a Shared World Together, Springer, 2020.

B–4. **Thomas, E., (Editor)** - Innovations in WASH Impact Measures - Water and Sanitation Measurement Technologies and Practices to Inform the Sustainable Development Goals, The World Bank, 2018

a. **Thomas, E.,** Executive Summary
b. **Thomas, E.,** Chapter 5: Sensing WASH: in-situ and remote sensing technologies

B–5. **Thomas, E., (Editor),** Broken Pumps and Promises: Incentivizing Impact in Environmental Health Springer, 2016.

a. **Thomas, E.,** Chapter 1: Introduction
b. Yuthas, K., **Thomas, E.,** Chapter 2: Performance Over Promises
c. **Thomas, E.,** Barstow, C., Clasen T., Chapter 8: Incentivizing Impact: Privately Financed Public Health in Rwanda
d. O'Reilly, K., Louis, E., **Thomas, E.,** Sinah, A., Chapter 13: Combining Sensors and Ethnography to Evaluate Latrine Use in India

Legislation

1. Expert consultant and co-author, "HB20-1072 Study Emerging Technologies For Water Management," Colorado State Legislature. Signed into law by Gov. Polis 2021.

Refereed Publications (advisees noted in italics, corresponding author noted with astrix)

J–1. **Thomas, E*.,** Ntazinda, J., Kathuni, S., "Applying climate reparative finance toward water security," Science of the Total Environment, 2023.

J–2. Burleson, G., … et al, **Thomas.E,** "Advancing Sustainable Development: Emerging Factors and Futures for the Engineering Field," Sustainability, 2023.

J–3. *Kirsch, K.,* Nagel, C., Iribagiza, C., *Ecklu, J.,* Zawandi, G., Ntabaza, P., Barstow, C., Lund, A., Harper, J., Carlton, E., Javernick-Will, A., Linden, K., **Thomas, E*.,** "Study design and baseline to evaluate water service provision among peri-urban communities in Kasai Oriental, Democratic Republic of the Congo," Plos One, 2023.

J–4. *Holland, M., Demaree, K.,* **Thomas, E*.**, "Investigating technology opportunities toward improved Colorado water monitoring: Insights from key informant interviews and stakeholder surveys," Plos Water, 2023.

J–5. *Macharia, D., Mugabo, L.,* Kasiti, F., Noriega, A., MacDonald, L., **Thomas, E*.,** "Streamflow and flood prediction in Rwanda using machine learning and remote sensing in support of rural first-mile transport connectivity," Frontiers in Climate, 2023.

J-6. *Falcone, M.,* Salvinelli, C., Bah, Mohammad, **Thomas, E*.,** "Effectiveness of a water-vending kiosk intervention toward household water quality and surveyed water security in Freetown, Sierra Leone," Science of the Total Environment, 2023.

J-7. *Holland, M.,* Thomas, C., Johnson, A., Livneh, B., **Thomas, E.*,** "Development and validation of an in-situ groundwater abstraction sensor network, hydrologic statistical model and blockchain trading platform - A demonstration in Solano County, California," ES&T Water, https://doi.org/10.1021/acsestwater.2c00214, 2022.

J-8. *Bedell, E., Harmon, O., Fankhauser, K.,* Shivers, Z., **Thomas, E.*,** "A continuous, in-situ, near-time fluorescence sensor coupled with a machine learning model for detection of fecal contamination risk in drinking water: Design, characterization and field validation," Water Resources, https://doi.org/10.1016/j.watres.2022.118644, 2022.

J-9. *Sharpe, T., Iribagiza, C,* Iorkubur, E., Coyle, J., Fenwick, C., Greggio, E., Kassam, P. ,Feighery, J., Andres, L, **Thomas, E.*,**. *Electronic sensors to monitor functionality and usage trends of rural water infrastructure in Plateau State, Nigeria,* Journal of Development Engineering. https://doi.org/10.1016/j.deveng.2022.100100, 2022.

J-10. *Libey, A.,* Kebede, A., Ibrahim, J., Hutchings, P., Mekonta, L., Butterworth, J., **Thomas, E.*,** *Surveyed from Afar: Household water security, emotional well-being, and the reliability of water supply in the Ethiopian lowlands,* International Journal of Hygiene and Environmental Health, https://doi.org/10.1016/j.ijheh.2022.114059, 2022.

J-11. *Macharia, D.,* MacDonald, L, Mugabo, L., Donovan, K., Brooks, W., Gudissa, S., Noriega, A., Barstow, C., Dickinson, K., **Thomas, E.*,** "*Mixed methods study design, pre-analysis plan, process evaluation and baseline results of trailbridges in rural Rwanda,"* Science of the Total Environment, https://doi.org/10.1016/j.scitotenv.2022.156546, 2022.

J-12. *Fankhauser, K., Macharia, D.,* Coyle, J., Kathuni, S., McNally, A., Slinksi, K, **Thomas, E.*,** "Estimating groundwater use and demand in arid Kenya through assimilation of satellite data and in-situ sensors with machine learning toward drought early action," Science of the Total Environment, https://doi.org/10.1016/j.scitotenv.2022.154453, 2022.

J-13. Haque, S., Kirby, M., Iyakereyme, L., Gebremariam, A., Tessema, G., **Thomas, E.,** Chang, H., Clasen, T., "Effects of adding household water filters to Rwanda's community-based environmental health promotion program: A cluster randomized controlled trial in Rwamagana district," njp Clean Water, https://doi.org/10.1038/s41545-022-00185-y, 2022.

J-14. Buchwald., A., **Thomas, E.,** Carlton, E., "The association between rainfall, temperature and reported basic water use: A multi-country analysis," GeoHealth, 10.1029/2022GH000605, 2022.

J-15. *Macharia, D., Fankhauser, K.,* Selker, J., *Thomas, E.*,* "Statistical evaluation of satellite-based rainfall products over Africa using TAHMO in-situ rainfall observations," Journal of Hydrometeorology, https://doi.org/10.1175/JHM-D-21-0161.1, 2022.

J-16. *Libey, A., Chintalapati, P.,* Amadei, B., **Thomas, E*,** "A System Dynamics Model of Water Service Delivery Enabled by Remotely Reporting Sensors and Dispatch," ASCE journal of Environmental Engineering, 2022 (IN PRESS).

J–17. Laura MacDonald, **Evan Thomas*,** Amy Javernick-Will, Jesse Austin-Breneman, Iana Aranda, Carlo Salvinelli, Rita Klees, Jeffrey Walters, Mary Jane Parmentier, David Schaad, Ayush Shahi, Emily Bedell, Gunars Platais, Joe Brown, John Gershenson, David Watkins, Esther Obonyo, Vinka Oyanedel-Craver, Mira Olson, Rachael Lau, Gouthami Rao, Alexander Arzon, Kiruba Krishnaswamy, Amy J Pickering, Christopher Mabey, Abigale Johnson, Rachel Gehr, Karl Linden, "Aligning Learning Objectives and Approaches in Global Engineering Graduate Programs: Review and Recommendations by an Interdisciplinary Working Group," Journal of Development Engineering, 2022.

J–18. *Iribagiza, C., Sharpe, T.,* Coyle, J., Nkubito, P., Piedrahita, R., Johnson, M., **Thomas, E.*,** "Evaluating the Effects of Access to Air Quality Data on Household Air Pollution and Exposure—An Interrupted Time Series Experimental Study in Rwanda", Sustainability, 2021.

J–19. **Thomas, E*,** Salvinelli, C., Harper, J., MacDonald, L., Klees, R., Platais, G., Javernick-Will A., Linden, K., "A Body of Knowledge and Pedagogy for Global Engineering," International Journal for Service Learning in Engineering, 2021.

J–20. **Thomas, E.*,** Wilson, D., Kathuni, S*., Libey A., Chintalpati, P.,* Coyle, J. "A contribution to drought resilience in East Africa through groundwater pump management informed by ensemble machine learning, in-situ instrumentation and remote sensing", Science of The Total Environment, 2021.

J–21. **Thomas, E.*,** *Bradshaw, A.,* Mugabo,L., MacDonald, L., Brooks, W., Dickinson, K., Donovan, K., "Engineering environmental resilience: A matched cohort study of the community benefits of trailbridges in rural Rwanda", Science of The Total Environment, 2021.

J–22. *Bradshaw, A.,* Mugabo, L., Gebremariam, A., **Thomas, E.*,** MacDonald, L., "Integration of household water filters with community based sanitation and hygiene promotion - A process evaluation and assessment of use among households in Rwanda", *Sustainability* 2021, *13*(4), 1615. **(Special Issue Guest Editor – did not review own paper).**

J–23. **Thomas, E.*,** Brown, J., **"**Using Feedback to Improve Accountability in Global Environmental Health and Engineering, Environmental Science and Technology, 2020.

J–24. **Thomas, E.*,** Kathuni S., Wilson, D., Muragijimana, C., *Sharpe, T.,* Kaberia, D., *Macharia, D.,* Kebede, A., Birhane, P., The Drought Resilience Impact Platform (DRIP): Improving Water Security Through Actionable Water Management Insights, Frontiers in Climate, V2. A6. 2020.

J–25. *Iribagiza, C., Sharpe, T.,* Wilson, D. **Thomas, E.*,** User-centered design of an air quality feedback technology to promote adoption of clean cookstoves. *J Expo Sci Environ Epidemiol* 30, 925–936 (2020).

J–26. *Libey, A.,* Adank, M., **Thomas**, **E.*** Who pays for water? Comparing life cycle costs of water services among several low, medium and high-income utilities, World Development, Volume 136, 2020.

J–27. *Bedell, E.; Sharpe, T.;* Purvis, T.; Brown, J.; **Thomas, E.*** Demonstration of Tryptophan-Like Fluorescence Sensor Concepts for Fecal Exposure Detection in Drinking Water in Remote and Resource Constrained Settings. *Sustainability* **2020**, *12*, 3768.

J-28. *Junglen, K.;* Rhodes-Dicker, L.; Ward, B.J.; Gitau, E.; Mwalugongo, W.; Stradley, L.; **Thomas, E.*** Characterization and Prediction of Fecal Sludge Parameters and Settling Behavior in Informal Settlements in Nairobi, Kenya. *Sustainability* 2020, *12*, 9040.

J-29. Hollander, D.; Ajroud, B.; **Thomas, E.;** Peabody, S.; Jordan, E.; Javernick-Will, A.; Linden, K. Monitoring Methods for Systems-Strengthening Activities Toward Sustainable Water and Sanitation Services in Low-Income Settings. *Sustainability* **2020**, *12*, 7044.

J-30. **Evan Thomas*,** Elizabeth Jordan, Karl Linden, Beshah Mogesse, Tamene Hailu, Hussein Jirma, Patrick Thomson, Johanna Koehler, Greg Collins, Reducing drought emergencies in the Horn of Africa, Science of The Total Environment, Volume 727, 2020, 138772, ISSN 0048-9697,https://doi.org/10.1016/j.scitotenv.2020.138772.

J-31. *Nick Turman-Bryant, Taylor Sharpe,* Corey Nagel, Lauren Stover, **Evan A. Thomas***, Toilet alarms: A novel application of latrine sensors and machine learning for optimizing sanitation services in informal settlements, Development Engineering, Volume 5, 2020, 100052, ISSN 2352-7285, 2020.

J-32. *Rasheed, R. M.,* **Thomas, E.** A., Gardner, P., Rogers, T., Verduzco, R., & Weislogel, M. M. (2020). Omni-Gravity Nanophotonic Heating and Leidenfrost-Driven Water Recovery System, *Gravitational and Space Research*, *8*(1), 31-44.

J-33. **Thomas E*,** *Gerster S,* Mugabo L, Jean H, Oates T (2020) Computer vision supported pedestrian tracking: A demonstration on trail bridges in rural Rwanda. PLOS ONE 15(10): e0241379.

J-34. Frederick G. B. Goddard, Radu Ban, Dana Boyd Barr, Joe Brown, Jennifer Cannon, John M. Colford, Joseph N. S. Eisenberg, Ayse Ercumen, Helen Petach, Matthew C. Freeman, Karen Levy, Stephen P. Luby, Christine Moe, Amy J. Pickering, Jeremy A. Sarnat, Jill Stewart, **Evan Thomas**, Mami Taniuchi, and Thomas Clasen, "Measuring Environmental Exposure to Enteric Pathogens in Low-Income Settings: Review and Recommendations of an Interdisciplinary Working Group", *Environmental Science & Technology* 2020 *54* (19), 11673-11691 DOI: 10.1021/acs.est.0c02421

J-35. **Thomas, E.*,** "Toward a New Field of Global Engineering," *Sustainability* 2019, *11*, 3789.

J-36. *Fankhauser, K.,* Nagel, C., Barstow, C., Kirby, M., **Thomas, E.*,** "Geospatial-temporal, demographic, and programmatic adoption characteristics of a large-scale water filter and improved cookstove intervention in Western Province, Rwanda," Cogent Environmental Science, 2019.

J-37. *Sharpe, T.,* Muragimana, C., **Thomas, E.*,** "Product Design Supporting Improved Water, Sanitation, and Energy Services Delivery in Low-Income Settings," Sustainability, 2019.

J-38. *Barstow, C.,* Bluffstone, R., Silon, K., Linden, K., **Thomas, E.*,** "A cost-benefit analysis of livelihood, environmental and health benefits of a large scale water filter and cookstove distribution in Rwanda," Journal of Development Engineering, 2019.

J-39. **Thomas, E.*,** Needoba, J., Kaberia, D., Butterworth, J., Adams, E., Oduor, P., *Macharia, D.,* Mitheu, F., Mugo, R., Nagel, C. "Quantifying increased groundwater demand from prolonged

drought in the East African Rift Valley," *Science of the Total Environment*, v. 666, p 1265-1272. 2019

J-40. Kirby, M., Nagel, C., Rosa, G., Zambrano, L., Ngirabega, J., Condo, J., **Thomas, E.,** Clasen, T., "Effects of a large-scale distribution of water filters and rocket stoves on diarrhoea and ARI: a cluster randomised controlled trial in Western Province, Rwanda," Plos Med, 2019.

J-41. *Turman-Bryant, N.,* Nagel, C., Stover, L., Muragijimana, C., **Thomas, E.*,** "Improved Drought Resilience Through Continuous Water Service Monitoring and Specialized Institutions—A Longitudinal Analysis of Water Service Delivery Across Motorized Boreholes in Northern Kenya," *Sustainability,* 11(11), 2019.

J-42. Martinsen, A., Hulland, E., Phillips, R., Darius, J., Felker-Kantor E., Simpson, D., Stephens, M., **Thomas, E.,** Quick, R., Handzel, T., " Alternative Water Transport and Storage Containers: Assessing Sustained Use of the PackH2O in Rural Haiti", American Journal of Tropical Medicine and Hygiene. DOI: 2019.

J-43. Anderson, D., **Thomas, E.,** Clasen, T., "Quantifying averted disability adjusted life years as a performance indicator for water quality interventions: A review of current methodologies and challenges," Water, 2018.

J-44. *Turman-Bryant, N., Fankhauser, K.,* Clasen, T., **Thomas, E.*,** "Measuring Progress Toward Sanitation and Hygiene Targets," Waterlines, 2018.

J-45. Andres, L., Borja-Vega, C., **Thomas, E.*,** "Using On-site and Remote Sensing Technologies to Monitor Water and Sanitation Use and Interventions", Water, 2018.

J-46. *Barstow, C.,* Kirby, M., Clasen, T., **Thomas, E*.,** "Health, livelihood, and environmental impacts of the distribution of a carbon-credit-financed, large-scale water filter and improved cookstove programme in Rwanda," *Case Report, Lancet Planetary Health,* DOI: 10.1016/S2542-5196(18)30116-5, 2018.

J-47. Wilson, D., Coyle, J., **Thomas, E.*,** "Ensemble Machine Learning and Forecasting Can Achieve 99% Uptime for Rural Handpumps," PloS ONE, http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0188808, 2017.

J-48. Kirby, M., Nagel, C., Rosa, G., Umupfasoni M., Iyakareyme, L., **Thomas, E.,** Clasen, T., "Use, microbiological effectiveness and health impact of a household water filter intervention in rural Rwanda—A matched cohort study," International Journal of Hygiene and Environmental Health, 2017.

J-49. Delea, M., Nagel, C., **Thomas E.,** Halder, A., Amin, N., Shoab, A., Freeman, M., Unicomb, L., Clasen, T., "Comparison of respondent-reported and sensor-recorded latrine utilization measures in rural Bangladesh: a cross-sectional study," Transactions of The Royal Society of Tropical Medicine and Hygiene, 2017.

J-50. *Bedell, E.,* Leslie, M., Fankhauser, K., Burnett, J., Wing, M., **Thomas, E.*,** ""Unmanned Aerial Vehicle Based Structure from Motion Biomass Inventory Estimates." Journal of Applied Remote Sensing 11(2), 2017.

J-51. **Thomas, E.*,** Beyond Broken Pumps and Promises: Rethinking Intent and Impact in Environmental Health, Journal of Energy Research and Social Science, v25 pp 33-36, 2017. http://dx.doi.org/10.1016/j.erss.2016.12.006.

J-52. Snoad, C., Nagel, C., Bhattacharya, A., **Thomas, E.*** "The effectiveness of sanitary inspections as a risk assessment tool for faecal contamination of rural drinking water: A review of data from West Bengal India," American Journal of Tropical Medicine and Hygiene, doi: 10.4269/ajtmh.16-0322, 2017.

J-53. Clasen, T., Zambrano, L., Rosa, G., Kirby, M., *Barstow, C.,* **Thomas, E.*,** Nagel, C., "Study design of a cluster-randomized controlled trial to evaluate a large-scale distribution of cook stoves and water filters in Western Province, Rwanda," Contemporary Clinical Trials, (4) http://dx.doi.org/10.1016/j.conctc.2016.07.003, 2016.

J-54. *Barstow, C.,* Nagel, C., Clasen, T., **Thomas, E.*,** "Process Evaluation and Assessment of Use of a Large Scale Water Filter and Cookstove Program in Rwanda," BMC Public Health BMC Public Health 16:584 DOI 10.1186/s12889-016-3237-0, 2016.

J-55. **Thomas, E.*,** *Tellez-Sanchez, S.,* Wick, C., Kirby, M., Zambrano, L., Rosa, G., Clasen, T., Nagel, C., "Behavioral Reactivity Associated with Electronic Monitoring of Environmental Health Interventions - A Cluster Randomized Trial with Water Filters and Cookstoves," *Environmental Science and Technology,* DOI: 10.1021/acs.est.6b00161, 2016.

J-56. Bohnert, K., Chard, A., Mwaki, A., Kirby, A., Muga, R., Nagel, C., **Thomas, E.,** Freeman, M., Comparing Sanitation Delivery Modalities in Urban Informal Settlement Schools: A Randomized Trial in Nairobi, Kenya, International Journal of Environmental Research and Public Health, 13(12), 1189; doi:10.3390/ijerph13121189, 2016.

J-57. Sinha, A., Nagel, C., **Thomas, E.,** Schmidt, W., Torondel, B., Boisson, S., Clasen, T., "Assessing Latrine Use in Rural India: A Cross-Sectional Study Comparing Reported Use and Passive Latrine Use Monitors," American Journal of Tropical Medicine and Hygiene, 95(3), doi:10.4269/ajtmh.16-0102. 2016.

J-58. Nagel, C., Beach, J., *Iribagiza, C.,* **Thomas, E.*,** "Evaluating Cellular Instrumentation on Rural Handpumps to Improve Service Delivery – A Longitudinal Cohort Study in Rural Rwanda," *Environmental Science and Technology (49) 24* DOI: 10.1021/acs.est.5b04077*,* 2015.

J-59. Kipf, A., Brunette, W., Kellerstrass, J., Podolsky, M., Rosa, J., Sundt, M., Wilson, D., Borriello, G., Brewer, E., **Thomas, E.*,** "A Proposed Integrated Data Collection, Analysis and Sharing Platform for Global Development," *Journal of Development Engineering*, doi:10.1016/j.deveng.2015.12.002, 2015. **(Also serve as Associate Editor, did not review paper).**

J-60. O'Reilly, K., Louis, E., **Thomas, E**., Sinha, A., "Combining Remote Monitoring and Ethnography to Estimate Household Latrine Usage in Rural India," *Journal of Water, Sanitation and Hygiene for Development*, (5), 3, doi: 10.2166/washdev.2015.155, 2015.

J-61. *Barstow, C.,* Ngabo, F., Rosa, G., Majorin, F., Boisson, S., Clasen, T., **Thomas, E.*,** "Designing and Piloting a Large-Scale Project to Provide Water Filters and Improved Cookstoves in Rwanda," *PLoS One,* 2014.

J-62. **Thomas, E.*,** *Barstow, C.,* Rosa, G., Majorin, F., Clasen, T., "Use of Remotely Reporting Electronic Sensors for Assessing Use of Water Filters and Cookstoves in Rwanda," *Environmental Science and Technology,* 2013. **DOI:** 10.1021/es403412x.

J-63. Rosa, G., Majorin, F., Boisson, S., *Barstow, C.,* Johnson, M., Kirby, M., Ngabo, F., Binagwaho, A., **Thomas, E.,** Clasen, T., "Assessing the Impact of Water Filters and Improved Cookstoves on Drinking Water Quality and Household Air Pollution: A Randomised Controlled Trial in Rwanda," *PLoS One,* 2014. DOI: 10.1371/journal.pone.0091011

J-64. **Thomas, E.*,** *Zumr, Z., Barstow, C.,* Fleming, M., Spiller, K., *Remotely accessible and reconfigurable in-situ instrumentation to improve monitoring of global development interventions*, Sustainability, August 2, 2013.

J-65. **Thomas, E.*,** *Measuring Sustainability,* Solutions Journal, Volume 3, Issue 4, pp. 41-44, 2012

J-66. **Thomas, E.*,** Weislogel, M., Klaus, D., *Design Strategies for Sustainable Spacecraft Fluid Management Systems,* Advances in Space Research, 46, p. 761-767, doi: 10.1016/j.asr.2010.04.005, 2010

J-67. **Thomas, E.*,** Amadei, B., *Accounting for Human Behavior, Local Conditions and Organizational Constraints in Humanitarian Development Models,* Journal of Environment, Development and Sustainability, DOI 10.107/s10668-009-9196-1,V, 12(3), p. 313-327, 2010

J-68. **Thomas, E.*,** Klaus, D., *Developing Sustainable Spacecraft Water Management Systems,* 2009-2010 Decadal Survey on Biological and Physical Sciences in Space, National Research Council of The National Academies, 2009

J-69. Amadei, B., Sandekian, R., **Thomas, E.,** *A Model for Sustainable Humanitarian Engineering Projects,* Sustainability, *1*(4), 1087-1105; doi:10.3390/su1041087, 2009

J-70. **Thomas, E.*,** Poritz, D., Muirhead, D., *Urine Advancing Contact Angle on Several Surfaces,* Journal of Adhesion Science and Technology, 2009. V. 23 p. 1917-1923.

J-71. **Thomas, E.*,** Muirhead, D., *Impact of Wastewater Fouling on Contact Angle,* Journal of Biofouling, V. 25. N. 5. Pp. 445-454, 2009

J-72. Weislogel, M., **Thomas, E.,** Graf, J., *A Novel Device Addressing Design Challenges for Passive Fluid Phase Separations Aboard Spacecraft* Microgravity Science and Technology, 2009. 21(3) p. 257-268.

J-73. Gold, M., **Thomas, E.*,** Byyny, R., Habanabakize, J., *Development and Implementation of the* Bring Your Own Water Treatment System *in Dense, Rural, and Mountainous Rwandan Communities,* Journal of Engineering for Sustainable Development, V2.N1, 2007

<u>Non-Refereed Publications</u>

C-1. Profiles in Global Engineering, Engineering for Change, 2020/2021

C-2. **Thomas, E.,** "Lessons from Rwanda on tackling unsafe drinking water and household air pollution," The Conversation, February 2020.

C-3. **Thomas, E.,** "The Intersectionality of WASH, Climate Change, and the Coronavirus," USAID ClimateLinks, July 2020.

C-4. **Thomas, E.,** "Water for People, Water for Agriculture: Using Earth Observations and Networked Sensors to End Drought Emergencies," USAID AgriLinks, May 2020.

C-5. **Thomas, E.,** "Groundwater can prevent drought emergencies in the Horn of Africa. Here's how," The Conversation, November 2019.

C-6. **Thomas, E.,** "Measured Impact, Not Promised Intent," Mechanical Engineering Magazine, August 2016.

C-7. **Thomas, E.,** "The Internet of Broken Things," Mechanical Engineering Magazine, April, 2016.

C-8. **Thomas, E.,** "Disruptive Drones," Tech Buzz – Global Development, Mechanical Engineering Magazine, November 2015.

C-9. **Thomas, E.,** "What Is a Mechanical Engineer?," Tech Buzz – Global Development, Mechanical Engineering Magazine, July 2015.

C-10. **Thomas, E.,** "Making Gains in Rwanda," Tech Buzz – Global Development, Mechanical Engineering Magazine, March 2015.

C-11. **Thomas, E.,** "Maintenance Matters," Tech Buzz – Global Development, Mechanical Engineering Magazine, December 2014.

C-12. **Thomas, E.,** "How Appropriate?," Tech Buzz – Global Development, Mechanical Engineering Magazine, August 2014.

C-13. Delea, M., Freeman, M., Halder, A., White, Z., **Thomas, E.,** Clasen T., "An Assessment of Latrine Coverage and Use Under BRAC's WASH II Project in Bangaldesh," Report to the Gates Foundation, 2015.

C-14. Holyard, J., Barry, B., **Thomas, E.,** "WASH Emergency Innovations Assessment Syria Crisis," Mercy Corps Report to Gates Foundation, May, 2014.

C-15. **Thomas, E.,** "Im/Proving Global Impact: Feedback on Program Outcomes," The Freshwater Trust, December 2013. http://www.thefreshwatertrust.org/main/freshwater-9-contents-2/freshwater-9-back-talk/

C-16. **Thomas, E.**, "(Im)Proving Global Impact: How the Integration of remotely reporting sensors in water projects may demonstrate and enhance positive change," UNESCO Global Water Forum, December 1, 2013.

C-17. **Thomas, E.,** Mattson, K., "Counting Heads," DEMAND: ASME Global Development Review, 2013.

C-18. **Thomas, E.,** Mattson, K., *Integration of Instrumented Behavior Monitoring with Public Health Evaluation Tools: An Application to a Water and Sanitation Program in Per-urban Jakarta, Indonesia,* Mercy Corps, 2013

C-19. **Thomas, E.,** *Leveraging carbon financing to enable accountable water treatment programs,* Global Water Forum, 2012

C-20. **Thomas, E.,** Yowell, L., *NASA's Social Innovation Concept: Human Development and Space Exploration,* Center for a Better Life LiveBetter Magazine, 2012

C-21. **Thomas, E.,** Zumr, Z., Barstow, C., Linden, K., *Proving Sustainability: The International Development Monitoring Initiative* IEEE Global Health and Technology Conference, 2011

C-22. Yowell, L., **Thomas,** E., *Social Innovation Concepts at NASA: Integrating International Development Challenges and Hand-On Prototyping with Spacecraft Design Training,* International Conference on Environmental Systems 2011

C-23. Huff, A., Rhead, E., Zumr, Z., **Thomas, E.,** *Sustainable Oxygen: A low power approach for providing emergency medical oxygen for spacecraft and hospitals in developing countries,* International Conference on Environmental Systems 2011

C-24. **Thomas, E.,** *Developing Sustainable Life Support System Concepts,* International Conference on Environmental Systems 2010

C-25. **Thomas, E.,** *Development of a Contingency Capillary Wastewater Management Device,* International Conference on Environmental Systems 2010

C-26. Bentley, N., **Thomas, E.,** Van Wie, M., Morrison, C., Stinson, R., *Second Generation International Space Station (ISS) Total Organic Carbon Analyzzer (TOCA) Verification Testing and On-Orbit Performance Results,* International Conference on Environmental Systems 2010

C-27. **Thomas, E.,** Leidich, J., Klaus, D., *A Sustainable Regolith-Based Water Recovery Concept for the Lunar Outpost,* International Conference on Environmental Systems 2009

C-28. Leidich, J., **Thomas, E.,** Klaus, D., *A Novel Testing Protocol for Evaluating Particle Behavior in Fluid Flow Under Simulated Reduced Gravity Conditions,* International Conference on Environmental Systems 2009

C-29. **Thomas, E.,** *2008-01-2054 Wastewater Brine Dewatering Technology Assessment and Development Roadmap* International Conference on Environmental Systems 2008

C-30. Amadei, B., Sandekian, R., **Thomas, E.,** *A model for sustainable international humanitarian engineering trips,* Journal of Engineering Education (submitted 2009)

C-31. **Thomas, E.,** Graf, J., Sweterlitsch, J., Weislogel, M., *2008-01-2041 Development of the Static Phase Separator* International Conference on Environmental Systems 2008

C-32. Callahan, M., Lubman, A., MacKnight, A., Rifert, V., Barabash, P., **Thomas, E.,** Pickering, K. *2008-01-2195 Cascade Distillation Subsystem Development Testing* International Conference on Environmental Systems 2008.

C-33. Cibuzar, B., **Thomas, E.,** Peterson, L., Goforth, J. *2008-01-2144 Development of Urine Receptacle Assembly for the Crew Exploration Vehicle* International Conference on Environmental Systems 2008.

C-34. Azman, A., **Thomas, E.,** *Engineering Education Through Service Learning in Developing Communities: Two Case Studies* American Society for Engineering Education Annual Conference and Exposition 2006.

C-35. **Thomas, E.,** Klaus, D., *Technology Readiness of a Modulated Laser Analyzer of Combustion Products for the Manned Spacecraft Environment,* ASCE Earth and Space Conference, 2006

7Invited Presentations

- Keynote, Regional Centre for Mapping of Resources for Development Conference, Nairobi, Kenya, 2022.
- UN Science and Technology forum speaker, 2021
- US Army water sensor technology exchange speaker, 2021
- UBC West Talks speaker, 2021
- CSU ETHOS Conference speaker, 2021
- GlobalPDX Podcast, 2020
- Impact Engineered Speaker, 2020
- University of Toronto Center for Global Engineering Speaker, 2020
- Invited lecture at IBM Think Conference, San Francisco, February 2019
- Invited lecture at IRC WASH All Systems Go Conference, The Hague, March 2019
- Plenary speaker at Colorado Water Congress, Steamboat Springs, August 2019
- Invited Testimony to Natural Resources Committee on emerging technologies for water management, Colorado State Legislature, Denver, September 2019
- Invited seminar speaker at Colorado School of Public Health Environmental Health department, University of Colorado Anschutz.
- Webinar speaker, USAID Sustainable WASH Systems Learning Partnership, June 2019.
- Invited panel speaker at Stockholm World Water Week, September 2019.
- Invited speaker at AGU event hosted by NASA Chief Scientist, December 2019.
- Invited participant for Gates Foundation funded workshop on health exposure monitoring technologies, Emory University, Atlanta, September 2019.
- Invited participant for Environmental Law Institute workshop on "Digital Technologies for Colorado River Basin", Denver, October 2019.
- Invited Speaker, GSMA Mobile for Development, Dar es Salaam, 2017
- Keynote Speaker, International Congress of Electronics, Controls and Telecommunications, Bogata, Columbia 2017
- Invited Featured Speaker, World Bank Joint Energy & Water Knowledge Event, Innovations in Measuring Health Impact in Water, Sanitation & Household Energy Interventions, 2017
- Measured Symposium, School for the Visual Arts, New York City, January 2017
- World Bank Development Impact Metrics and Evaluation, Plenary Presentation, Berkeley, CA November 2016
- Development Impact Lab, Plenary Presentation, Berkeley, California, October 2016
- WASH Symposium, Plenary Speaker, Boulder, Colorado March 2016
- NetHope Keynote Presentation, Atlanta, Georgia November 2016
- Gates Foundation / University of Washington Nutrition Think Tank Technical Symposium, November 2015.
- Rockefeller Foundation Bellagio Center, Bellagio, Italy, July 2015
- USAID TechCon Plenary Lecture, November 2014
- Stockholm Environmental Institute, September 2014
- TedX Santa Cruz, March 2014
- Ashoka University, San Diego, March 2013

- International Space University, Gratz Austria, March 2011
- Commonwealth Club, San Francisco, CA, 2012
- Stanford University Engineering Seminar Series, CA, 2012
- International Space University, Graz, Austria, 2011
- Economist Social Business Summit, London, UK 2011
- United Nations High Level Conference on Water and Global Health, NYC, 2010
- Unite for Sight Global Health and Innovation Conference, Yale University, 2010
- Clinton Global Initiative Environment and Public Health Panel Invited Panelist, University of Texas at Austin, 2009