

# ANNE STEINEMANN

## Educational History

PhD, 1993, Stanford University, Civil and Environmental Engineering  
MS, 1985, University of California, Los Angeles, Civil Engineering  
BS, 1984, University of California, Irvine, Civil Engineering, Magna cum Laude

## Employment History

Professor of Engineering 2019–present  
Chair of Sustainable Infrastructure  
College of Science and Engineering  
James Cook University  
Townsville, Australia

Professor of Civil Engineering 2015–present  
Chair of Sustainable Cities  
Department of Infrastructure Engineering  
School of Engineering  
The University of Melbourne  
Melbourne, Australia

Adjunct Professor 2015–2019  
College of Science and Engineering  
James Cook University  
Townsville, Australia

Program Manager 2012–2015  
Scripps Institution of Oceanography  
Climate, Atmospheric Sciences, and Physical Oceanography  
University of California, San Diego

Senior Research Scientist 2013–2015  
Leader, National Integrated Drought Information System  
State of California Program  
Cooperative Institute for Research in Environmental Sciences

Professor of Civil and Environmental Engineering 2004–2013  
Professor of Public Affairs  
Director, The Water Center  
University of Washington

Visiting Professor 2010–2011  
Civil and Environmental Engineering  
Stanford University

Research Associate 2004–2012  
Climate Research Division  
Scripps Institution of Oceanography  
University of California, San Diego

Associate Professor	2000–2004
Assistant Professor	1995–2000
City and Regional Planning Program	
College of Architecture	
Georgia Institute of Technology	
Adjunct Professor	1998–2004
School of Public Policy	
Georgia Institute of Technology	
Adjunct Professor	2001–2012
Marine and Environmental Systems	
Florida Institute of Technology	
Postdoctoral Scholar	1993–1995
Department of Civil and Environmental Engineering	
Stanford University	
Associate Director	1990–1992
Center for Teaching and Learning	
Stanford University	
Visiting Faculty	1988–1989
Department of Computer and Information Science	
Linköping University, Sweden	
Engineering Hydrologist	1985–1988
US Geological Survey	
Menlo Park and San Diego, California	

### **Research Expertise and Interests**

Climate-Related Hazards  
 Disaster Risk Reduction and Resilience  
 Drought Indicators and Water Management  
 Environmental Exposure and Impact Assessment  
 Healthy Buildings  
 Indoor Air Quality  
 Product Emissions  
 Tropics and Sustainability

## **Awards and Honors**

Awarded, Climate Science Service Award, State of California, for developing "useful science" to "bridge between the academic research community and practitioners," 2014

Appointed, Indoor Air Quality Advisor to the Bullitt Center in Seattle, WA, winner of the "World's Greenest Commercial Building" award, 2013

Honored, US National Science Foundation, "Engineer of the New Millennium," 2011

Appointed, Mayor's Green Ribbon Commission, developed Climate Action Plan that was adopted by more than 1,000 mayors internationally, and resulted in Seattle winning "Most Livable City" award, 2008

Appointed, NSF International/American National Standards Institute (ANSI), Joint Committee for Health-Based Standards for Consumer Product Emissions, 2010–present

Awarded, American Water Resources Association, Outstanding Chapter of the Year, 2006  
Faculty leader of AWRA student chapter

Appointed, Special Adviser to Governor of the State of Georgia, 1998–2004

Appointed, Special Adviser to the States of Florida, Georgia, and Alabama, 1998–2004

Appointed, President's National Drought Policy Commission, workgroups, 2000

US Congress, invited to provide expert testimony, 2000

Hesburgh Award (Highest national honor for university teaching programs), 1999

Junior Faculty Teacher of the Year (Highest University Award), Georgia Tech, 1997

Outstanding Teacher of the Year (Highest College Award), Georgia Tech, 1996

National Science Foundation CAREER Award, highest national honor for junior faculty in science and engineering, 1998

American Association of University Women Scholar, 1993

Rotary Foundation International Scholar, 1998

University of California Regents Scholar, 1985

University of California Chancellor's Scholar, 1984

Female Engineer of the Year, University of California, Irvine, 1984

Civil Engineer of the Year, University of California, Irvine, 1984

Tau Beta Pi, Engineering Honor Society

Member, Engineers Australia

## **Publications**

### **Refereed journal articles**

Steinemann A. 2021. The Fragranced Products Phenomenon: Air Quality and Health, Science and Policy. *Air Quality, Atmosphere, and Health* 14:235–243.

Nematollahi N, Ross PA, Hoffmann AA, Kolev SD, Steinemann A. 2021. Limonene Emissions: Do Different Types Have Different Biological Effects? *International Journal of Environmental Research and Public Health* 18(19):10505.

Ross PA, Nematollahi N, Steinemann A, Kolev SD, Hoffmann AA. 2021. Differential toxicological effects of natural and synthetic sources and enantiomeric forms of limonene on mosquito larvae. *Air Quality Atmosphere and Health* 20 Oct.

Steinemann A, Nematollahi N, Rismanchi B, Goodman N, Kolev SD. 2021. Pandemic Products and Volatile Chemical Emissions. *Air Quality, Atmosphere, and Health* 14:47–53.

Goodman N, Nematollahi N, Steinemann A. 2021. Fragranced Laundry Products and Emissions from Dryer Vents: Implications for Air Quality and Health. *Air Quality, Atmosphere, and Health* 14:245–249.

Nematollahi N, Weinberg JL, Flattery J, Goodman N, Kolev SD, Steinemann A. 2021. Volatile Chemical Emissions from Essential Oils with Therapeutic Claims. *Air Quality, Atmosphere, and Health* 14:365–369.

Steinemann A, Nematollahi N, Weinberg JW, Flattery J, Goodman N, Kolev SD. 2020. Volatile Chemical Emissions from Car Air Fresheners. *Air Quality, Atmosphere, and Health* 13:329–334.

Steinemann A, Nematollahi N. 2020. Migraine Headaches and Fragranced Consumer Products: An International Population-Based Study. *Air Quality, Atmosphere, and Health* (7 Mar)

Nematollahi N, Kolev SD, Steinemann A. 2019. Volatile Chemical Emissions from 134 Common Consumer Products. *Air Quality, Atmosphere, and Health* 12(11):1259–1265.

Goodman N, Nematollahi N, Agosti G, Steinemann A. 2019. Evaluating Air Quality With and Without Air Fresheners. *Air Quality, Atmosphere, and Health* 13(1):1-4.

Steinemann A. 2019. Ten Questions concerning Fragrance-Free Policies and Indoor Environments. *Building and Environment* 159:1–8.

Steinemann A, Klaschka U. 2019. Exposures and Effects from Fragranced Consumer Products in Germany. *Air Quality, Atmosphere, and Health* 12(12):1399–1404.

Steinemann A. 2019. International Prevalence of Fragrance Sensitivity. *Air Quality, Atmosphere, and Health* 12(8):891–897.

Steinemann A, Goodman N. 2019. Fragranced Consumer Products and Effects on Asthmatics: An International Population-based Study. *Air Quality, Atmosphere, and Health* 12(6):643–649.

- Steinemann A. 2019. International Prevalence of Chemical Sensitivity, Co-prevalences with Asthma and Autism, and Effects from Fragranced Consumer Products. *Air Quality, Atmosphere, and Health* 12(5):519–527.
- Steinemann A. 2019. Chemical Sensitivity, Asthma, and Effects from Fragranced Consumer products: National Population Study in the United Kingdom. *Air Quality, Atmosphere, and Health* 12(4):371–377.
- Goodman NB, Wheeler AJ, Paevere PJ, Agosti G, Nematollahi N, Steinemann A. 2019. Emissions from Dryer Vents During Use of Fragranced and Fragrance-Free Laundry Products. *Air Quality, Atmosphere, and Health* 12(3):289–295.
- Steinemann A. 2019. Chemical Sensitivity, Asthma, and Effects from Fragranced Consumer Products: National Population Study in Sweden. *Air Quality, Atmosphere, and Health* 12(2):129–136.
- Steinemann A. 2018. Fragranced Consumer Products: Effects on Asthmatics. *Air Quality, Atmosphere, and Health* 11(1):3–9.
- Nematollahi N, Kolev SD, Steinemann A. 2018. Volatile Chemical Emissions from Essential Oils. *Air Quality, Atmosphere, and Health* 11(8):949–954.
- Steinemann A. 2018. National Prevalence and Effects of Multiple Chemical Sensitivities. *Journal of Occupational and Environmental Medicine* 60(3):e152–e156.
- Steinemann A. 2018. Fragranced Consumer Products: Effects on Autistic Adults in the United States, Australia, and United Kingdom. *Air Quality, Atmosphere, and Health* 11(10):1137–1142.
- Steinemann A, Wheeler AJ, Larcombe A. 2018. Fragranced Consumer Products: Effects on Asthmatic Australians. *Air Quality, Atmosphere, and Health* 11(4):365–371.
- Nematollahi N, Doronila A, Mornane P, Duan A, Kolev SD, Steinemann A. 2018. Volatile Chemical Emissions from Fragranced Baby Products. *Air Quality, Atmosphere, and Health* 11(7):785–790.
- Steinemann A. 2018. Exposures and Effects from Fragranced Consumer Products in Sweden. *Air Quality, Atmosphere, and Health* 11(5):485–491.
- Steinemann A. 2018. Fragranced Consumer Products: Sources of Emissions, Exposures, and Health Effects in the United Kingdom. *Air Quality, Atmosphere, and Health* 11(3):253–258.
- Steinemann A. 2018. Prevalence and Effects of Multiple Chemical Sensitivities in Australia. *Preventive Medicine Reports* 10:191–194.
- Goodman NB, Wheeler AJ, Paevere PJ, Selleck PW, Cheng M, Steinemann A. 2018. Indoor Volatile Organic Compounds at an Australian University. *Building and Environment* 135:344–351.
- Steinemann A, Wargocki P, Rismanchi B. 2017. Ten Questions Concerning Green Buildings and Indoor Air Quality. *Building and Environment* 112:351–358.

- Lunny S, Nelson R, Steinemann A. 2017. Something in the Air but Not on the Label: A Call for Increased Regulatory Ingredient Disclosure for Fragranced Consumer Products. *University of New South Wales Law Journal* 40(4):1366–1391.
- Steinemann A. 2017. Health and Societal Effects from Fragranced Consumer Products. *Preventive Medicine Reports* 5:45–47.
- Goodman NB, Steinemann A, Wheeler AJ, Paevere PJ, Cheng M, Brown SK. 2017. Volatile Organic Compounds within Indoor Environments in Australia. *Building and Environment* 122:116–125.
- Steinemann A. 2017. Ten Questions Concerning Air Fresheners and Indoor Built Environments. *Building and Environment* 111:279–284.
- Steinemann A. 2016. Fragranced Consumer Products: Exposures and Effects from Emissions. *Air Quality, Atmosphere, and Health* 9(8):861–866.
- Steinemann A, Iacobellis SF, Cayan DR. 2015. Developing and Evaluating Drought Indicators for Decision-Making. *Journal of Hydrometeorology* 16(4):1793–1803.
- Shukla S, Steinemann A, Iacobellis SF, Cayan DR. 2015. Annual Drought in California: Association with Monthly Precipitation and Climate Phases. *Journal of Applied Meteorology and Climatology* 54:2273–2281.
- Steinemann A. 2015. Volatile Emissions from Common Consumer Products. *Air Quality, Atmosphere, and Health* 8(3):273–281.
- Sealey L, Steinemann A, Pestaner J, Hughes BW, Bagasra O. 2015. Environmental Factors May Contribute to Autism Development and Male Bias: Effects of Fragrances on Developing Neurons. *Environmental Research* 142:731–738.
- Steinemann A. 2014. Drought Information for Improving Preparedness in the Western States. *Bulletin of the American Meteorological Society* 95(6):843–847.
- Fontaine MM, Steinemann AC, Hayes MJ. 2014. State Drought Programs and Plans: Survey of the Western United States. *ASCE Natural Hazards Review* 15(1):95–99.
- Rosenberg EA, Wood AW, Steinemann AC. 2013. Informing Hydrometric Network Design for Statistical Seasonal Streamflow Forecasts. *Journal of Hydrometeorology* 14(5):1587–1604.
- Steinemann AC, Gallagher LG, Davis AL, MacGregor IC. 2013. Chemical Emissions from Residential Dryer Vents During Use of Fragranced Laundry Products. *Air Quality, Atmosphere, and Health* 6(1):151–156.
- Rosenberg EA, Clark EA, Steinemann AC, Lettenmaier DP. 2013. On the Contribution of Groundwater Storage to Interannual Streamflow Anomalies in the Colorado River Basin. *Hydrology and Earth System Sciences* 17(4):1475–1491.
- Steinemann AC, MacGregor IC, Gordon SM, Gallagher LG, Davis AL, Ribeiro DS, Wallace LA. 2011. Fragranced Consumer Products: Chemicals Emitted, Ingredients Unlisted. *Environmental Impact Assessment Review* 31(3):328–333.

Rosenberg EA, Wood AW, Steinemann AC. 2011. Statistical Applications of Physically Based Hydrologic Models to Seasonal Streamflow Forecasts. *Water Resources Research* 47(3).

Shukla S, Steinemann AC, Lettenmaier DP. 2011. Drought Monitoring for Washington State: Indicators and Applications. *Journal of Hydrometeorology* 12(1):66–83.

Rosenberg EA, Keys PW, Booth DB, Hartley D, Burkey J, Steinemann AC, Lettenmaier DP. 2010. Precipitation Extremes and the Impacts of Climate Change on Stormwater Infrastructure in Washington State. *Climatic Change* 102(1–2):319–349.

Visitacion B, Booth DB, Steinemann AC. 2009. Costs and Benefits of Stormwater Management: Case Study of the Puget Sound Region. *ASCE Journal of Urban Planning and Development* 135(4):150–158.

Caress SM, Steinemann AC. 2009. Prevalence of Fragrance Sensitivity in the American Population. *Journal of Environmental Health* 71(7):46–50.

Fontaine M, Steinemann AC. 2009. Assessing Vulnerability to Natural Hazards: Impact-Based Method and Application to Drought in Washington State. *Natural Hazards Review* 10(1):11–18.

Steinemann AC. 2009. Fragranced Consumer Products and Undisclosed Ingredients. *Environmental Impact Assessment Review* 29(1):32–38.

Caress SM, Steinemann AC. 2009. Asthma and Chemical Hypersensitivity: Prevalence, Etiology, and Age of Onset. *Toxicology and Industrial Health* 25(1):71–78.

Padgett JP, Steinemann AC, Clarke JH, Vandenberg MP. 2008. A Comparison of Carbon Calculators. *Environmental Impact Assessment Review* 28(2–3):106–115.

Vandenberg MP, Steinemann AC. 2007. The Carbon-Neutral Individual. *New York University Law Review* 82(6):1673–1745.

Steinemann A. 2006. Using Climate Forecasts for Drought Management. *Journal of Applied Meteorology and Climatology* 45(10):1353–1361.

Steinemann A, Cavalcanti L. 2006. Developing Multiple Indicators and Triggers for Drought Plans. *ASCE Journal of Water Resources Planning and Management* 132(3):164–174.

Alfaro E, Pierce D, Steinemann A, Gershunov A. 2005. Relationships Between the Irrigation-Pumping Electrical Loads and the Local Climate in Climate Division 9 Idaho. *Journal of Applied Meteorology* 44(12):1972–1978.

Caress S, Steinemann A. 2005. National Prevalence of Asthma and Chemical Hypersensitivity: An Examination of Potential Overlap. *Journal of Occupational and Environmental Medicine* 47(5):518–522.

Alfaro E, Gershunov A, Cayan D, Steinemann A, Pierce D, Barnett TA. 2004. Method for Prediction of California Summer Air Surface Temperatures. *EOS Transactions American Geophysical Union* 85:553, 557–558.

- Caress S, Steinemann A. 2004. A National Population Study of the Prevalence of Multiple Chemical Sensitivity. *Archives of Environmental Health* 59(6):300–305.
- Steinemann A. 2004. Human Exposure, Health Hazards, and Environmental Regulations. *Environmental Impact Assessment Review* 24(7/8):695–710.
- Caress S, Steinemann A. 2004. Prevalence of Multiple Chemical Sensitivities: A Population-Based Study in the Southeastern United States. *American Journal of Public Health* 94(5):746–747.
- Steinemann A, Tickner J. 2004. Environment and Health: New Answers, New Questions. *Environmental Impact Assessment Review* 24(7–8):661–665.
- Steinemann A. 2003. Implementing Sustainable Development through Problem-Based Learning: Pedagogy and Practice. *ASCE Journal of Professional Issues in Engineering Education and Practice* 129(4):216–224.
- Caress S, Steinemann A. 2003. A Review of a Two-Phase Population Study of Multiple Chemical Sensitivities. *Environmental Health Perspectives* 111(12):1490–1497.
- Steinemann A. 2003. Drought Indicators and Triggers: A Stochastic Approach to Evaluation. *Journal of the American Water Resources Association* 39(5):1217–1233.
- Beck MB, Fath BD, Parker AK, Osidele OO, Cowie GM, Rasmussen TC, Patten BC, Norton BG, Steinemann A, Borrett SR. 2002. Developing a Concept of Adaptive Community Learning: Case Study of a Rapidly Urbanizing Watershed. *Integrated Assessment* 3(4):299–307.
- Keysar E, Steinemann A. 2002. Integrating Environmental Impact Assessment with Master Planning: Lessons from the US Army. *Environmental Impact Assessment Review* 22(6):583–609.
- Caress S, Steinemann A, Waddick C. 2002. Symptomatology and Etiology of Multiple Chemical Sensitivities in the Southeastern United States. *Archives of Environmental Health: An International Journal* 57(5):429–436.
- Steinemann A. 2001. Improving Alternatives for Environmental Impact Assessment. *Environmental Impact Assessment Review* 21:3–21.
- Norton B, Steinemann A. 2001. Environmental Values and Adaptive Management. *Environmental Values* 10(4):473–506.
- Gilbreath J, Steinemann A. 2000. Hazardous Pesticides in Developing Countries: A Case Study of Zambia, Africa. *Environmental Practice* 2:311–317.
- Simon K, Steinemann A. 2000. Soil Bioengineering: Challenges for Planning and Engineering. *ASCE Journal of Urban Planning and Development* 126(2):89–102.
- Steinemann A. 2000. Rethinking Human Health Impact Assessment. *Environmental Impact Assessment Review* 20:627–645.
- Cosgriff B, Steinemann A. 1998. Industrial Ecology for Sustainable Communities. *Journal of Environmental Planning and Management* 41(6):661–672.



- Shepherd (Steinemann) A. 1998. Drought Contingency Planning: Evaluating the Effectiveness of Plans. *ASCE Journal of Water Resources Planning and Management* 124(5):246–251.
- Shepherd (Steinemann) A, Cosgriff B. 1998. Problem-Based Learning: A Bridge Between Planning Education and Planning Practice. *Journal of Planning Education and Research* 17(4):348–357.
- Coffin S, Shepherd (Steinemann) A. 1998. Barriers to Brownfield Redevelopment: Lessons Learned from Two Great Lakes States. *Journal of Public Works Management and Policy* 2(3):258–266.
- Shepherd (Steinemann) A. 1998. Knowledge-Based Expert Systems: Critiquing versus Conventional Approaches. *International Journal of Expert Systems with Applications* 14(4):433–441.
- Shepherd (Steinemann) A, Bowler C. 1997. Beyond the Requirements: Improving Public Participation in EIA. *Journal of Environmental Planning and Management* 40(6):725–738.
- Shepherd (Steinemann) A. 1997. Interactive Implementation: Promoting Acceptance of Expert Systems. *Computers, Environment, and Urban Systems* 21(5):317–333.
- Shepherd (Steinemann) A, Ortolano L. 1997. Organizational Change and Environmental Impact Assessment at the Electricity Generating Authority of Thailand: 1972–1988. *Environmental Impact Assessment Review* 17(5):329–356.
- Shepherd (Steinemann) A, Ortolano L. 1996. Strategic Environmental Assessment for Sustainable Urban Development. *Environmental Impact Assessment Review* 16:321–335.
- Shepherd (Steinemann) A, Ortolano L. 1996. Water-Supply System Operations: Critiquing Expert- System Approach. *ASCE Journal of Water Resources Planning and Management* 122(5):348–355.
- Ortolano L, Shepherd (Steinemann) A. 1995. Environmental Impact Assessment: Challenges and Opportunities. *Impact Assessment* 13(1):3–30.
- Shepherd (Steinemann) A, Ortolano L. 1994. Critiquing Expert Systems for Planning and Management. *Computers, Environment, and Urban Systems* 18(5):305–314.
- Waern Y, Hägglund S, Löwgren J, Rankin I, Sokolnicki T, Steinemann A. 1992. Communication Knowledge for Knowledge Communication. *International Journal of Man-Machine Studies* 37:215–239.
- Ortolano L, Steinemann A. 1987. New Expert Systems in Environmental Engineering. *ASCE Journal of Computing in Civil Engineering* 1(4):298–302.

### **Refereed monographs**

- Steinemann A. 1989. Evaluation of Nonpotable Ground Water in the Desert Area of Southeastern California for Powerplant Cooling. US Geological Survey Water Supply Paper no 2343.

Farrar CD, Sorey ML, Rojstaczer SA, Steinemann A, Clark MD. 1989. Hydrologic and Geochemical Monitoring in Long Valley Caldera, Mono County, California. US Geological Survey Open File Report 80-4033.

### **Articles in professional journals**

Shepherd (Steinemann) A, Hausser W. 1997. Project XL: Reinventing Environmental Regulation by Building New Partnerships. *National Association of Environmental Professionals News* 22(1):10-11.

Shepherd (Steinemann) A, Simm S. 1997. The Integration of Environmental Impact Assessment with Major Investment Studies for Highway Planning. *Environmental Planning Quarterly* 14(2):3-10.

### **Commentary in refereed journals**

Steinemann A. 2019. Fragrance Inhalation and Adverse Health Effects. *Regulatory Toxicology and Pharmacology* 106:349-350.

Steinemann A. 2016. Commentary on An Informatics Approach to Evaluating Combined Chemical Exposures from Consumer Products: A Case Study of Asthma-Associated Chemicals and Potential Endocrine Disruptors. *Environmental Health Perspectives* 124(9):A155.

### **Books**

Steinemann A. 2018. *Microeconomics for Public Decisions* (3rd ed). ISBN 10: 0692174079

Steinemann AC. 2011. *Microeconomics for Public Decisions* (2nd ed). Menlo Park, CA:Askmar Publishing.

Ott W, Steinemann A, Wallace L, eds. 2007. *Exposure Analysis*. Boca Raton, FL:CRC Press.

Steinemann AC, Apgar WC, Brown HJ. 2005. *Microeconomics for Public Decisions*. Cincinnati, OH:Thomson/South-Western.

### **Chapters in books**

Steinemann A, Walsh N. 2007. Environmental Laws and Exposure Analysis. In: *Exposure Analysis* (Ott W, Steinemann A, Wallace L, eds). Boca Raton, FL:CRC Press, 487-513.

Steinemann A, Hayes M, Cavalcanti L. 2005. Drought Indicators and Triggers. In: *Drought and Water Crises: Science, Technology, and Management Issues* (Wilhite D, ed). Boca Raton, FL:CRC Press, 71-92.

Norton B, Steinemann A. 2002. Environmental Values and Adaptive Management. In: *Searching for Sustainability* (Norton B, ed). Cambridge, UK:Cambridge University Press, 514-547.

Shepherd (Steinemann) A. 1998. Post Project Monitoring and Impact Assessment. In: *Environmental Methods Review: Retooling Impact Assessment for the New Century* (Fittipaldi J, Porter A, eds). Washington, DC:Army Environmental Policy Institute.

Ortolano L, Shepherd (Steinemann) A. 1995. Environmental Impact Assessment. In: *Social and Environmental Impact Assessment* (Vanclay F, ed). Chichester, UK:John Wiley and Sons, 3-30.

## Research Activities

### Funded Research

Sponsor: Australia Commonwealth Scientific and Industrial Research Organisation (CSIRO), Land and Water

Title: Sustainable Tropical Built Environments

Amount: \$500,000

Position: Lead Chief Investigator

Dates: 2015–2022

Purpose: To develop and implement a sustainable and healthy tropical housing prototype, with features of water and energy efficiency, low emissions and effluents, climate sensitive design, and disaster resilience

Sponsor: Australia Department of the Environment, Clean Air and Urban Landscapes

Title: Indoor Air Quality

Amount: \$8,880,000 (\$360,000 individual share)

Position: Chief Investigator

Dates: 2015–2021

Purpose: To investigate air pollutants within indoor built environments, analyse emission sources, and assess impacts on ambient air quality and health

Sponsor: National Oceanic and Atmospheric Administration

Title: National Integrated Drought Information System (NIDIS) for California

Amount: \$309,918

Position: Lead Chief Investigator

Dates: 2010–2015

Purpose: To develop and implement a drought early warning system to reduce drought impacts, working with agencies, industries, decision-makers, and stakeholders

Sponsor: National Oceanic and Atmospheric Administration

Title: Regional Integrated Sciences and Assessment, CNAP

Amount: \$3,495,217

Position: Investigator

Dates: 2011–2016

Purpose: To develop and provide science for societal applications in water resources, extreme events, climate related hazards, and environmental management

Sponsor: National Oceanic and Atmospheric Administration

Title: Developing and Evaluating Drought Indicators

Amount: \$199,379

Position: Lead Chief Investigator

Dates: 2013–2015

Purpose: To develop indicators to assess and forecast drought, and to evaluate their effectiveness for providing early warning and reducing impacts

Sponsor: National Oceanic and Atmospheric Administration

Title: Drought Assessment, Prediction, and Decision-Making

Amount: \$95,000

Position: Lead Chief Investigator

Dates: 2011–2016

Purpose: To analyze drought indicators and develop drought forecasts for decision-making

Sponsor: National Oceanic and Atmospheric Administration—SeaGrant  
Title: SoundCitizen: Students and Citizens Working Together to Evaluate Sources and Fates of Emerging Pollutants  
Amount: \$220,000  
Position: Co-Chief Investigator  
Dates: 2010–2011  
Purpose: To trace emerging pollutants from households, to stormwater, surface water, and wastewater, and into Puget Sound and other water bodies

Sponsor: National Oceanic and Atmospheric Administration  
Title: Southern California NIDIS: Drought Monitoring and Forecasting  
Amount: \$55,000  
Position: Lead Chief Investigator  
Dates: 2011–2012  
Purpose: To develop a drought monitoring and forecast system for the Southern California region, partnering with industries, agencies, and stakeholders

Sponsor: National Oceanic and Atmospheric Administration  
Title: Hydrologic Analysis for California and Nevada Droughts  
Amount: \$30,516  
Position: Lead Chief Investigator  
Dates: 2010–2011  
Purpose: To examine historical droughts in California and Nevada, compare drought indicators with impacts, and incorporate results into drought plans

Sponsor: National Oceanic and Atmospheric Administration  
Title: State Drought Planning in the Western US  
Amount: \$98,248  
Position: Lead Chief Investigator  
Dates: 2009–2010  
Purpose: To develop and communicate drought monitoring and forecast information for improved drought planning and response in the Western US

Sponsor: Seattle Public Utilities  
Title: Toxic Chemicals from Household Consumer Products in Stormwater, Wastewater, and Puget Sound  
Amount: \$219,626  
Position: Lead Chief Investigator  
Dates: 2008–2010  
Purpose: To investigate the relationships among chemicals in household consumer products, their presence in water systems and water bodies, and impacts

Sponsor: State of Washington, Center for Trade and Economic Development  
Title: Climate Impacts, Vulnerability, and Adaptations: Infrastructure Systems in Washington State  
Amount: \$110,000  
Position: Lead Chief Investigator  
Dates: 2007–2009  
Purpose: To assess projected impacts of climate change on infrastructure systems, identify vulnerable regions and sectors, and develop adaptations

Sponsor: US Geological Survey  
Title: West-Wide Drought Forecasting System: A Scientific Foundation for NIDIS  
Amount: \$250,000  
Position: Lead Chief Investigator  
Dates: 2006–2011  
Purpose: To develop a drought forecast and nowcast system for the Western US, and to provide early warning capabilities and science-based indicators for NIDIS

Sponsor: National Oceanic and Atmospheric Administration (NOAA)  
Title: Using NOAA Climate Forecasts with Hydrologic Assessment to Reduce Drought Vulnerability and Improve Water Management in Washington State  
Amount: \$293,283  
Position: Lead Chief Investigator  
Dates: 2006–2011  
Purpose: To develop and implement climate and hydrologic forecasts for water management, and to assess the net economic benefits of this forecast information

Sponsor: National Aeronautics and Space Administration (NASA)  
Title: Improving Water Resources Management in the Western US Through Use of Remote Sensing Data and Seasonal Climate Forecasts  
Amount: \$1,200,000  
Position: Co-Chief Investigator  
Dates: 2006–2009  
Purpose: To develop hydrologic and climate prediction models for use by three operational water management agencies: the Natural Resources Conservation Service, the US Bureau of Reclamation, and the California Department of Water Resources

Sponsor: State of Washington, Center for Trade and Economic Development  
Title: Drought Impact Assessment and Mitigation  
Amount: \$100,000  
Position: Lead Chief Investigator  
Dates: 2005–2006  
Purpose: To assess the impacts from recent droughts, identify vulnerable areas and sectors, and develop indicators to monitor and forecast drought conditions

Sponsor: The Russell Family Foundation  
Title: Shelf to Sound: Educational Outreach  
Amount: \$40,000  
Position: Co-Chief Investigator  
Dates: 2010–2011  
Purpose: To develop an educational outreach program, using results from the Shelf to Sound research project, and provide guidance on less-toxic products

Sponsor: State of Washington, Department of Ecology  
Title: State Drought Plan  
Amount: \$80,000  
Position: Lead Chief Investigator  
Dates: 2006–2007  
Purpose: To evaluate and improve the State of Washington Drought Plan, including indicators and triggers, responses, and climate change adaptations

Sponsor: National Oceanic and Atmospheric Administration (NOAA)  
Title: Climate Forecasts for Improving Management of Energy and Hydropower Resources in the Western US  
Amount: \$2,000,000  
Position: Co-Chief Investigator  
Dates: 2005–2008  
Purpose: Predict variations in water and energy supplies and demands across the Western US on seasonal time scales, in order to improve joint management of resources

Sponsor: Seattle Public Utilities  
Title: Analysis of Endocrine Disrupting Chemicals from Consumer Products in Stormwater and Wastewater in an Urban, Residential Seattle Watershed  
Amount: \$120,000  
Position: Lead Chief Investigator  
Dates: 2006–2006  
Purpose: To analyze the presence and sources of endocrine disrupting chemicals (EDCs) in surface waters and wastewaters of a residential watershed in Seattle

Sponsor: Puget Sound Action Team  
Title: The Environmental, Economic, and Societal Costs of Stormwater Runoff in the Puget Sound Region  
Amount: \$36,000  
Position: Lead Chief Investigator  
Dates: 2006–2006  
Purpose: To identify, analyze, and quantify the costs of stormwater runoff in the Puget Sound region, and the benefits of stormwater management

Sponsor: Puget Sound Regional County Agencies  
Title: Water and Watersheds Research Consortium  
Amount: \$150,000  
Position: Lead Chief Investigator  
Dates: 2005–2008  
Purpose: To address water issues in the region, such as low-impact development, drought, stormwater management, instream flows, and sustainability

Sponsor: National Oceanic and Atmospheric Administration (NOAA)  
Title: The Economic Benefit of Incorporating Weather and Climate Forecasts into Western Energy Production  
Amount: \$1,938,100  
Position: Co-Chief Investigator  
Dates: 2003–2004  
Purpose: Develop weather and climate forecasts for energy and water management in California, work with agencies and utilities to integrate forecasts into operations, and estimate the economic value of improved forecast information

Sponsor: National Science Foundation, CAREER Award  
Civil and Mechanical Systems, Hazard Reduction Program  
Title: Reducing Drought Hazards by Improving Drought Plans  
Position: Lead Chief Investigator  
Amount: \$410,000  
Dates: 1999–2006  
Purpose: Develop methods to analyze and mitigate risks of drought hazards, using a knowledge-based approach

Sponsor: National Science Foundation, Civil and Mechanical Systems  
Title: Interstate Drought Hazard Mitigation  
Position: Lead Chief Investigator  
Amount: \$100,000  
Dates: 2004–2006  
Purpose: Determine drought indicators for the ACT-ACF basin, and develop an interstate drought management plan for the states of Florida, Georgia, and Alabama

Sponsor: Federal Highway Administration  
Title: Consideration of Environmental Factors in Transportation Systems Planning  
Position: Co-Chief Investigator  
Amount: \$250,000  
Dates: 2001–2002  
Purpose: Develop methods for transportation agencies to address environmental requirements in strategic decisions and regional transportation plans

Sponsor: Georgia Department of Natural Resources  
Title: Drought Planning for the State of Georgia  
Position: Lead Chief Investigator  
Amount: \$50,000  
Dates: 1999–2002  
Purpose: Direct the drought planning process for Georgia, working with more than 100 stakeholders throughout the state Develop and implement first state drought plan

Sponsor: National Science Foundation-Environmental Protection Agency  
Title: Community Values and the Long-Term Ecological Integrity of Rapidly Urbanizing Watersheds  
Position: Co-Chief Investigator  
Amount: \$850,000  
Dates: 1998–2001  
Purpose: Develop watershed management methods for Lake Lanier, GA, integrating stakeholder objectives with scientific models

Sponsor: National Science Foundation  
Title: Decision-Making and Valuation for Environmental Policy  
A Multi-Criteria, Dynamic, and Place-Based Approach to Ecosystem Valuation  
Position: Co-Chief Investigator  
Amount: \$94,997  
Dates: 1997–1998  
Purpose: Design community-based methods for environmental valuation, assessing the intergenerational costs and benefits of development decisions

Sponsor: Georgia Research Alliance  
Title: Center for Urban and Regional Ecology  
Position: Co-Chief Investigator  
Amount: \$300,000  
Dates: 1998–1999  
Purpose: Investigate the interactions between human activities, ecological changes, and tools for managing the built and natural environment

Sponsor: National Science Foundation  
Title: Civil and Mechanical Systems, Hazard Reduction Program  
Evaluating the Effectiveness of Drought Response Strategies  
Position: Lead Chief Investigator  
Amount: \$18,000  
Dates: 1997–1998  
Purpose: Design and implement knowledge-based system to improve drought planning processes and drought contingency plans

Sponsor: Georgia Research Alliance  
Title: Environmentally Conscious Design and Construction of Infrastructure Projects  
Position: Co-Chief Investigator  
Amount: \$229,000  
Dates: 1996–1996  
Purpose: Develop methods for sustainability in the planning, design, construction, and operation of urban infrastructure systems



## **Leadership and Administrative Experience**

### **Research Program Leader, Tropical Healthy Housing and Disaster Risk Reduction**

James Cook University and The University of Melbourne, 2016–present

Leading an interdisciplinary research and engagement program in tropical healthy housing, together with academics, students, and partners from agencies, industries, and organisations

Designed and created a prototype tiny tropical healthy house, offering key features of healthy indoor air quality and tropical suitability, in addition to being energy and resource efficient, resilient to climate-related hazards, affordable, adaptable, self-sustaining, and transportable

Developed and leading a multi-disciplinary university research centre in disaster risk reduction, bringing together over 100 academics from across the campuses, and collaborating with international, national, state, and regional government agencies, industries, organisations, communities, universities, and stakeholders

### **National Program Leader, Drought Preparedness**

Scripps Institution of Oceanography, 2010–2015

Led the federal program for drought preparedness (National Integrated Drought Information System, NIDIS) for the State of California, bringing together and engaging with over 200 stakeholders from industries, agencies, organizations, academia, and the public

Received the Climate Services Award from the State of California for developing "useful science" to "bridge between the academic research community and practitioners" and for helping "decision-makers incorporate climate science into natural resource and infrastructure management"

### **Program Manager, Climate Science and Societal Applications**

Scripps Institution of Oceanography, 2012–2015

Provided leadership, management, industry engagement, and public outreach for the Regional Integrated Sciences and Assessments, California-Nevada Applications Program, a major research consortium for bridging climate science and societal applications

Created and led interdisciplinary teams with over 50 academics, professional staff, and partners, building collaborations among university researchers and the wider community

Engaged directly with over 150 partners from industries, government agencies, organizations, tribes, universities, and key decision-makers in the public and private sector

Individually designed and led the first strategic planning process with the consortium, implemented the plan, and ensured successful accomplishment of strategic goals

Produced widely adopted research that enables communities to prepare for and reduce impacts of climate-related hazards, including droughts, floods, fires, storms, heat waves, and sea level rise

**Director, The Water Center**

University of Washington, 2004–2008

Served as Director and research manager for a major interdisciplinary center for research, education, and public outreach, involving schools of engineering, atmospheric sciences, oceanography, environmental sciences, public policy, public health, law, and others across campus

Provided leadership for more than 35 academics, 25 researchers and postgraduate students, 25 advisory board members, 20 professional staff, and interacted with more than 1,000 external constituents from industry, agencies, organizations, and the public

Grew the Center team by more than five-fold (from 20 to over 100) within four years

Designed and led over 50 community-based applications of research, working with government officials, water and energy managers, industry leaders, non-governmental organizations, and tribes, together with university academics, staff, students, and researchers from multiple disciplines

Promoted wide dissemination and application of research program results through publications, presentations, research symposiums (300–400 attendees each event), seminars (over 100 attendees each week), and outreach materials

Designed and produced Water Center brochures, fact sheets, website, and a quarterly research newsletter sent to over 3,000 people

Managed a range of human resources activities, including hiring, performance evaluation, and compensation

Individually responsible for and conducted all major aspects of financial management, budgeting, reporting, and resource allocation decisions

Conducted significant development activities, established fellowships for faculty and students research, and more than tripled the level of donor support for the Center

Developed and implemented the Center's first Strategic Plan, the result of a two-year process with more than 200 affiliates

Implemented plan over five years, and achieved all major leadership, research, education, outreach, and financial goals for Center

## Teaching

### Courses Taught:

#### The University of Melbourne

- Sustainable Infrastructure Engineering

#### The University of Washington

- Microeconomic Policy Analysis
- Sustainability: Principles and Practice
- Water Resources, interdisciplinary course
- Environmental Health, directed research

#### Georgia Institute of Technology

- Water Resources Planning
- Environmental Impact Assessment
- Sustainable Urban Development
- Microeconomics for Planning and Policy
- Economic Analysis in Planning

Supervised and graduated more than 30 PhD and Masters thesis students

### Teaching Awards:

- Hesburgh Award (Highest national award for university teaching program), 1999
- Junior Faculty Teacher of the Year (Highest University Award), Georgia Tech, 1997
- Outstanding Teacher of the Year (Highest College Award), Georgia Tech, 1996

### Additional Teaching Activities (selected examples):

- New Faculty Orientation and Teaching Seminars: Invited presenter each year, for 15 years, at the University of Washington and Georgia Tech. Developed sessions for faculty and PhD students on ways to create synergies among teaching, research, and service. Individually authored the Peer Evaluation of Teaching guidelines for Georgia Tech.
- Mentor to over 100 students and early career researchers from underrepresented populations, resulting in a 95% successful recruitment and retention rate at the universities. Also mentor to junior faculty for developing and writing successful research proposals, resulting in a 75% success rate in their obtaining competitive funding within one year.
- Service-learning courses: Developed new courses and redesigned existing courses at the University of Washington and Georgia Tech to incorporate service-learning and public engagement. Students designed and implemented projects, working with members of the community, agencies, industries, and organizations. As the result of one course, student projects formed the sustainability master development plan implemented by the community.

## **Educational Outreach Activities**

### **Significant Activities and Events**

*Media Coverage (television appearances, radio presentations, newspaper interviews, etc):*

Research covered by more than 2,000 newspapers, magazines, major media outlets, and radio and television stations, including the Wall Street Journal, Washington Post, National Public Radio, Time Magazine, CBS News, ABC News, NBC News, Scientific American, USA Today, Boston Globe, Huffington Post, Herald Sun, Discovery Channel Magazine, Prevention Magazine, UK Daily Mail, The Australian, Herald Sun, Sydney Morning Herald, The Age, The Daily Telegraph, New York Daily News, Hindustan Times, Singapore National Radio, New Scientist, Science Daily, IFL Science, MSN.com, SBS Television, and WebMD.

International coverage spans six continents, including the countries of Canada, Australia, United States, Vietnam, New Zealand, Germany, Singapore, Japan, United Kingdom, India, Pakistan, China, Mexico, Guyana, Philippines, Nigeria, Slovenia, Uganda, Spain, Ghana, Italy, Indonesia, Kosovo, Poland, Chile, The Caribbean, Portugal, Malaysia, Rwanda, Ireland, Brazil, Albania, France, Russia, and Bulgaria.

Global reach for media coverage, collectively, exceeds 600 million people

Conducted more than 200 media interviews in the past five years

*Research results used in legislation, policies, and practices:*

United States S 1697 (2009), Household Products Labeling Act; United States S 696 (2013) Safe Chemicals Act; Nevada, AB 2342 (2011), Indoor Air Quality; Vermont, 18 VSA Ch 39 (2010) Health and Cleaning Products in Schools; Missouri, RSMo, Ch 161365 (2009) Green Cleaning in Schools; Georgia Drought Management Plan (2003); Arizona Drought Management Plan (2004); United States Environmental Protection Agency, Indoor Air Quality workplace guidelines (2014); United States Access Board, Fragrance-Free Policy, 7-26 (2000); Centers for Disease Control, CDC-SM-2009-01 (2009), Indoor Environmental Quality Policy

Internationally, more than 100 industries, agencies, and schools have changed their policies and practices, based on my research results and partnerships with them

*Director of Educational Outreach Activities:*

The Water Center Annual Review, 2005–2008 (300–400 attendees each year)

Environmental Health Lecture Series, 2007 (more than 300 attendees)

The Water Center Seminar Series (75–100 attendees each week)

The Watershed Review (quarterly research newsletter to more than 3,000 constituents)

Environmental Health community-based research applications (more than 50 projects)

Teaching and Learning Effectiveness Workshops (developed and led over 25 workshops)

## **Service**

(selected examples)

### **Departmental Service:**

Leader, Mentoring Committee, University of Melbourne

Research Committee, University of Melbourne

Academic Search Committee, University of Melbourne

Building Warden, University of Melbourne

Director, The Water Center, University of Washington, 2004–2008

Faculty Adviser, UW Student Chapter of the American Water Resources Association, 2004–2008  
Won Outstanding Chapter of the Year (highest national award) in 2006

Chair, Endowed Professorships Committee, Civil and Environmental Engineering (CEE), 2008

Chair, Committee to the College of the Environment, CEE, 2007

Chair, Edward Wenk Jr Endowed Lectureship Committee, CEE, 2007

Faculty Adviser, UW Student Chapter of Engineers Without Borders, 2004–2007

Faculty Mentor, Hubert H Humphrey Fellows Program, CEE, 2006

Director, Dual Master's Degree Program in Water Resources Planning – MS Civil and Environmental Engineering / MS City and Regional Planning, Georgia Tech, 1996–2004

Director, Dual Master's Degree Program in Environmental Management – MS Civil and Environmental Engineering / MS City and Regional Planning, Georgia Tech, 1996–2004

Chair, Peer Evaluation of Teaching Committee, Georgia Tech, 2002–2003

### **School and University Service:**

Director, Centre for Disaster Solutions, James Cook University

Leader, Women in STEM Mentoring Program, James Cook University

Leader, Early Career Researcher Mentoring Program, School of Engineering

Leader, Engineering Innovation Program, Tropical Sustainable Housing

Leader, Media Working Group, Melbourne School of Engineering

Executive Committee, Melbourne Sustainable Society Institute (MSSI), 2015–2018

Melbourne Sustainable Society Institute (MSSI), Future Cities Research Cluster, 2015–2018

Promotions Committee, School of Engineering, University of Melbourne, 2015–2016

Growth Strategy Committee, School of Engineering, University of Melbourne, 2015–2016

Faculty Mentoring Program, College of Engineering, University of Washington, 2004–2008

Steering Committee, Disability Studies Program, University of Washington 2007–2012

Chair of Civil and Environmental Engineering, Search Committee, 2007

Chair, College Awards and Scholarships Committee, Georgia Tech, 1995–2000

Chair, College Sustainability Work Group, Georgia Tech, 1998–2000

Director, Institute Committee for Peer Evaluation of Teaching, Georgia Tech, 2002–2004

Chair, United Way Charitable Campaign, Georgia Tech, 1996–1998

Institute Student Honors Committee, Georgia Tech, 2000–2003

Executive Board Member, elected position, highest level of faculty governance, Georgia Tech, 1996–1998

Leader, Annual New Faculty Orientation, Georgia Tech, 1996–2000

Academic Senate, Georgia Tech, 1996–1998

Faculty Senate, Georgia Tech, 1996–1998

### **Government Appointments and Agency Service**

NSF International/American National Standards Institute (ANSI), Joint Committee for Health-Based Standards for Consumer Product Emissions, 2010–2013

National Science Foundation IGERT, External Advisory Board Member, Indoor Environmental Science and Engineering, 2009–2011

Appointed to Seattle Mayor's Green Ribbon Commission, 2005

Appointed as Special Adviser on Water Resources to Governor of Georgia, 2000

Appointed to President's National Drought Policy Commission workgroups, 2000

Appointed as Special Adviser on drought issues to States of Florida, Georgia, and Alabama, 2000

Editorial Board, Environmental Impact Assessment Review, 2001–present

Editorial Board, PeerJ, 2012–present

## **Collaborative Research and Engagement with Agencies, Industries, and Organizations** (selected examples of recent partners)

Australian Government, Department of the Environment and Energy  
Australian Government, Department of Agriculture and Water Resources  
Australian Government, Department of Health  
Australian Government, Department of Human Services  
Australia Government, Bureau of Meteorology  
Australia National Industrial Chemicals Notification and Assessment Scheme  
World Bank  
Asian Development Bank  
Health Canada, Consumer Product Safety Bureau  
US Department of Defense  
US Environmental Protection Agency  
US National Institutes of Health  
US Green Building Council  
US Department of Energy  
Safe Work Australia  
Queensland Government, Office of the Inspector-General Emergency Management  
Queensland Fire and Emergency Services  
Queensland Department of Environment and Science  
Queensland Government, State Development, Manufacturing, Infrastructure and Planning  
Queensland Reconstruction Authority  
Victoria Environment Protection Agency  
Victoria Department of Health and Human Services  
California Department of Water Resources  
California Air Resources Board  
California Department of Public Health  
City of Melbourne  
Cairns Regional Council  
Townsville City Council  
IBM  
Finlay Construction  
Radcliffe International  
Choice  
Physicians for Social Responsibility  
Canberra Hospital  
Healthy House Institute  
International WELL Building Institute  
Arup