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DAVID I GUSTAFSON, PH.D.
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CURRENT RESPONSIBILITIES: Dr. Dave Gustafson is as an independent scientist and author who uses modeling to help food systems meet human nutrition needs in more resilient and sustainable ways.

EDUCATION:

Ph.D.
Chemical Engineering
University of Washington
September, 1983

Developed a controlled release system for the delivery of a biologically active ingredient in soil. Designed computer model for predicting the dissolution and uptake of the active ingredient.

B.S.
Chemical Engineering
Stanford University
June, 1980

Special emphasis on transport phenomena and bioengineering.

WORK HISTORY (ALL SUPERVISORS WITH *PHONE NUMBER* PROVIDED MAY BE CONTACTED)

2025-present Part-time	Ag Innovation Institute, Raleigh, NC	Member of Board of Directors President: Dr. Nick Goeser (*608-327-9034*)
2025-present Part-time	Earth Knowledge, Inc., Tucson, AZ	Member of Science Advisory Council CEO: Julia Armstrong-D'Agnese (*520-481-1793*)
2020-present Part-time	Washington State University Pullman, WA Biological Systems Engineering	Adjunct Faculty – Research role Supervisor: Dr. Kirti Rajagopalan (*515-450-7142*)
2019-present Part-time	Stone Environmental, Inc., Montpelier, VT	Chairman of the Board of Directors President: John Hanzas (*802-229-1877*)
2018-present Part-time	Conservation Technology Information Center (CTIC), Indianapolis, IN Hired to step-in and guide needed leadership transition; Continuing as Project Director	Project Director & Interim Executive Director (2018-2019, 2022) Executive Director: Ryan Heiniger (*319-768-8348*)
2012-present Part-time	St. Louis Reconciliation Network St. Louis, MO Founder of non-profit with a mission to heal the broken race relations of the St. Louis region by harnessing the potential collective power of its diverse faith communities	Founder, President, Chairman of the Board of Directors Executive Director: Brandon Wilkes (*513-257-4829*)
2008-present Part-time	Real Whirlwind, LLC St. Louis, MO Publisher of self-authored works and provider of food system modeling expertise	Founder and Principal Supervisor: Self-employed

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WORK HISTORY (*CONTINUED*)

2014-present	Agriculture & Food Systems Institute (formerly the ILSI Research Foundation) Washington, DC	Project Director and Founding Director, Center for Integrated Modeling of Sustainable Agriculture & Nutrition Security (CIMSANS)
Part-time	Co-led 5-year USDA/NIFA/AFRI project, "Fruit & Vegetable Supply Chains: Climate Adaptation & Mitigation Opportunities."	Supervisor: Andrew Roberts (*202-204-0482*)
2015-2018	Johns Hopkins University (DC campus) Washington University (St. Louis, MO)	Guest Lecturer: Climate Change & Impacts on Agriculture and Global Food Security
Part-time	Invited to provided lectures on climate change and food systems.	Supervisors: Jonathan Haskett (Johns Hopkins, *202-663-5645*); Chad Henry (Washington University, *314-495-1139*)
1993-2014	Monsanto Company St. Louis, MO	Sustainable Ag Policy (2011-2014); Bioenergy & Renewables (2010-2012); Regulatory Affairs (2007-2011); Global Bio-Evaluations (2006-2007); Environmental Sciences (2000-2005); Field Environmental Operations (1998-1999); Farm Optimization Team (1997); Environmental Sciences (1993-1996)
Full-time	Served as Fellow (1993-2003) and Senior Fellow (2003-2014), leading numerous applications of environmental modeling expertise in agricultural systems: water quality, precision ag, climate change, bioenergy, insect resistance, weed resistance, and pollen-mediated gene flow.	Supervisors: Michael Lohuis (2014, *314-378-0309*); Michael Doane (2011-2014, *314-315-0547*); Martha Schlicher (2010-2012); Bill Heydens (2007-2011); Brett Bussler (2006-2007); Rick Dirks (2000-2005); Tom Hoogheem (1998-1999); Steve S. Adams (1997); Monte Marshall (1993-1996)
1991-1993	Rhône-Poulenc Ag Co Research Triangle Park, NC	Environmental Science Department
Full-time	Served as a Senior Research Scientist leading the use of environmental modeling to understand and manage ag water quality issues.	Supervisor: Russ Jones
1985-1990	Monsanto Company St. Louis, MO	Environmental Science Department
Full-time	Served as a Senior Research Scientist leading the use of environmental modeling to understand and manage ag water quality issues.	Supervisor: Larry Holden
1983-1985	Shell Development Company Modesto, CA	Ag-Chem Formulations Department
Full-time	Served as a Research Scientist leading the use of environmental modeling to design controlled-release ag formulations.	Supervisor: John Cotton

SELECTED PUBLICATIONS

"Climate Analogs Academy STL Urban Ag Workshop: Executive Summary," available on real-whirlwind.com/library (2026). Published 30-Sep-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/7fdca5c1-c6fb-441d-8a41-990d65b5006e/STL-Urban-Ag-Workshop-Exec-Summary-30-Sep-2026.pdf?ver=1790778179542

"Day of Atonement: 2026 – But there's no atoning for what we have brought upon ourselves," blog on real-whirlwind.com/news (2026). Published 21-Sep-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/d7aacaf6-7aa8-4325-8b7a-44624f5fed46/Day-of-Atonement-2026.pdf?ver=1790051579776

"Memorial Day 2026 – Remembering the scars of our troubled past, and taking action," blog on real-whirlwind.com/news (2026). Published 25-May-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/8af42509-4498-4094-b8bc-679454d9cbf5/STL-RfR-AWITP-New-Lou.pdf?ver=1779715627428

"It feels like 'Déjà Vu All Over Again' – March torched a heat record set in 2012 – is another drought coming?" blog on real-whirlwind.com/news (2026). Published 22-Apr-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/d9a244ca-1c32-4cd3-a53d-da02450b0921/Deja-Vu-All-Over-Again.pdf?ver=1776857197546

"Adapt or Die! Hyperbolic? Perhaps. However, warming is now parabolic and accelerating – we must prepare," blog on real-whirlwind.com/news (2026). Published 18-Mar-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/eeb255f6-46dd-4fcb-b1eb-bc2d1deef2d4/Adapt-or-Die.pdf?ver=1773893290946

"Viridis View: Tracking Progress in Ag Conservation – Ten days remain to respond to new collaboration opportunity from CTIC," blog on real-whirlwind.com/news (2026). Published 3-Mar-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/77cefaa6-8e78-418a-a6af-9ee2ef46a830/Viridis-View-A-New-Collaboration-Opportunity.pdf?ver=1772567293555

"First Use of a New Cropping System Resilience Metric: Analysis of a 30-yr I-State dataset shows early gains have all been lost," blog on real-whirlwind.com/news (2026). Published 19-Jan-2026. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/35ffe43e-ad14-442f-903a-11b327593351/A-New-Cropping-System-Resilience-Metric.pdf?ver=1768852061991

"A 'New Lou' – Workshop Summary: Renewing neighborhoods through food system transformation," blog on real-whirlwind.com/news (2025). Published 25-Nov-2025. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/383099d8-85f8-4e8c-85ce-8808b86ad6c7/A-New-Lou-Workshop-Summary.pdf?ver=1764092571982

"It's Getting Hot Out There: Converting corn fields to solar or server farms would only make it worse," blog on real-whirlwind.com/news (2025). Published 30-Jul-2025. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/1b5c7aa2-5765-4fbd-b7bb-32547efadcba/It_s-Getting-Hot-Out-There.pdf?ver=1753884559656

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"'It's the Food System, Stupid!' – Transformation requires innovative thinking, not biased AI queries," blog on real-whirlwind.com/news (2025). Published 3-Jun-2025. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/f105b28e-0abc-4975-9116-a2755b8c5efc/Its-the-Food-System-Stupid.pdf?ver=1748953624055

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"Too Close for Comfort – Is St. Louis experiencing an increase in tornadoes?" blog on real-whirlwind.com/news (2025). Published 10-Apr-2025. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/2524d6a6-b9cc-4389-8c8c-425174ec7e7d/Too-Close-for-Comfort.pdf?ver=1744297863161

"They are the Egg Men – I am the Modeler: Would limiting flock size confer resilience to US egg supply chains?" blog on real-whirlwind.com/news (2025). Published 19-Mar-2025. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/9eb8b4c3-e385-44de-9c11-37a81cc4fe97/They-are-the-Egg-Men.pdf?ver=1742412519650

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"'Corn Sweat' as an Ecosystem Service: Estimating the financial and environmental benefits to the Midwest," blog on real-whirlwind.com/news (2024). Published 30-Sep-2024. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/0f93e37b-2ff9-4cf2-8637-d9dfec8e9878/Cooling-Ecosystem-Service.pdf?ver=1727729641914

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"It's Not the Humidity, It's the Heat: Don't blame 'corn sweat' for sweltering summer conditions in the Midwest," blog on real-whirlwind.com/news (2024). Published 6-Sep-2024. https://img1.wsimg.com/blobby/go/238f9c7b-06e6-49c5-8c75-b24ea12ed962/downloads/Debunking-Corn-Sweat.pdf?ver=1725627010655

"Cover Crop Adoption Slows According to Data," blog on DTN (2024). Published 18-Apr-2024. https://www.dtnpf.com/agriculture/web/ag/news/article/2024/04/17/real-time-data-needed-better-track-2.

"Multi-Model Ensemble Approach to Soil Carbon: Phase 1 Report," Conservation Technology Information Center, West Lafayette, IN, 10 pp.(2024). https://www.ctic.org/media/web/1708125358_MME-Soil-C-Phase-1-Report-Final.pdf

"Review of the 'Validation Report of *ecosys* Version 1.0,' Prepared for the Climate Action Reserve (CAR) by HabiTerre," Climate Action Reserve, 8 pp, dated 29-Jan-2024, https://www.climateactionreserve.org/wp-content/uploads/2024/05/Gustafson-Review-Ecosys-29-Jan-2024.pdf.

"Climate Analogs Can Catalyze Cross-Regional Dialogs for US Specialty Crop Adaptation," *Scientific Reports*, **13**:9317, https://doi.org/10.1038/s41598-023-35887-x (2023). co authors: S Chaudhary, K Rajagopalan, C Kruger, M Brady, C Fraisse, S Hall, G Hoogenboom, R Melnick, J Reyes, C Stöckle, T Sulser.

"Progress in Applying a Multi-Model Ensemble Approach to Soil Carbon" blog on agclimate.net (2023). Published 16-Jun-2023. https://www.agclimate.net/2023/06/16/progress-in-applying-a-multi-model-ensemble-approach-to-soil-carbon/ .

"What do Hurricanes and Soil Carbon Have in Common? The Wisdom of a Multi-Model Ensemble Approach," blog on agclimate.net (2022). Published 21-Nov-2022. https://www.agclimate.net/2022/11/21/what-do-hurricanes-and-soil-carbon-have-in-common-the-wisdom-of-a-multi-model-ensemble-approach/.

"In Pursuit of More Fruitful Food Systems," *International Journal of Life Cycle Assessment* (2022). https://doi.org/10.1007/s11367-022-02101-5. co authors: S Asseng, C Fraisse, K Guan, G Hoogenboom, C Kruger, J Kruse, M Matlock, R Melnick, R Parajuli, K Rajagopalan, C Stöckle, T Sulser, L Tarar, G Thoma, K Wiebe.

"Potential benefits of climate change for potatoes in the United States," *Environmental Research Letters*, **17** 104034 (2022). https://doi.org/10.1088/1748-9326/ac9242. co-authors: C Zhao, C Stöckle, T Karimi, RL Nelson, F van Evert, A Pronk, AA Riddle, E Marshall, R Raymundo, Y Li, K Guan, G Hoogenboom, S Asseng.

"Making Healthy, Sustainable Diets Accessible and Achievable: A New Framework for Assessing the Nutrition, Environmental and Equity Impacts of Packaged Foods," *Current Developments in Nutrition*, 6(10), (2022). https://doi.org/10.1093/cdn/nzac136. co-authors: E Decker, A Drewnowski, M Hamm, J Hwang, K Merrigan.

"Our Five-Year Mission … to Boldly Go Where No Integrated Model Has Gone Before," blog on agclimate.net (2022). Published 30-Jun-2022. https://www.agclimate.net/2022/06/30/our-five-year-mission-to-boldly-go-where-no-integrated-model-has-gone-before/.

"New Digital Tools for Fruit and Vegetable Growers," blog on agclimate.net (2022). Published 26-May-2022. https://www.agclimate.net/2022/05/26/new-digital-tools-for-fruit-and-vegetable-growers/.

"A Cornucopia of Opportunities for Domestic Produce," blog on agclimate.net (2022). Published 18-Feb-2022. https://www.agclimate.net/2022/02/18/a-cornucopia-of-opportunities-for-domestic-produce/.

"Climate Analogs: See the Future Now," blog on aglimate.net (2022). Published 27-Jan-2022. https://www.agclimate.net/2022/01/27/climate-analogs-for-specialty-crops-see-the-future-now/.

"Extreme Adaptation: Navigating the Troubled Waters of the 'New Normal'," blog on aglimate.net (2021). Published 13-Dec-21. https://www.agclimate.net/2021/12/13/extreme-adaptation-navigating-the-troubled-waters-of-the-new-normal/.

"The 'Carbon Market Bazaar': Future Windfall for Producers or Just Hot Air?" blog on aglimate.net (2021). Published 23-Nov-21. https://www.agclimate.net/2021/11/23/the-carbon-market-bazaar-future-windfall-for-producers-or-just-hot-air/.

"Will I be able to get fries with that? A new approach for answering life's big questions about the future of food," blog on agclimate.net (2021). Published 19-Oct-21. https://www.agclimate.net/2021/10/19/will-i-be-able-to-get-fries-with-that-a-new-approach-for-answering-lifes-big-questions-about-the-future-of-food/.

"Supply Chains for Processed Potato and Tomato Products in the US will have Enhanced Resilience with Planting Adaptation Strategies," *Nature Food* 2:862–872 (2021). https://doi.org/10.1038/s43016-021-00383-w. co-authors: S Asseng, J Kruse, G Thoma, K Guan, G Hoogenboom, M Matlock, M McLean, R Parajuli, K Rajagopalan, C Stöckle, TB Sulser, L Tarar, K Wiebe, C Fraisse, C Gimenez, P Intarapapong, T Karimi, C Kruger, Y Li, E Marshall, RL Nelson, A Pronk, R Raymundo, AA Riddle, M Rosenbohm, D Sonke, F van Evert, L Xiao, G Wu, C Zhao.

"Mitigating Tradeoffs as Global Fruit and Vegetable Systems Expand to Meet Dietary Recommendations," *Environmental Research Letters*, **16** 055010 (2021). co-authors: AE Stratton, JW Finley, E Mitcham, S Myers, R Naylor, J Otten, C Palm.

"Protocol for Life Cycle Assessment Modeling of US Fruit and Vegetable Supply Chains- Cases of Processed Potato and Tomato Products," *Data in Brief*, **34** 106639 (2021). https://doi.org/10.1016/j.dib.2020.106639, co-authors: R Parajuli, S Asseng, CO Stöckle, J Kruse, C Zhao, P Intrapapong, MD Matlock, G Thoma.

"Good news: US fruit and vegetable supply chains are resilient," blog on agclimate.net (2020). Published 17-Dec-20. https://www.agclimate.net/2020/12/17/good-news-us-fruit-and-vegetable-supply-chains-are-resilient/

"Mapping Conservation Management Practices and Outcomes in the Corn Belt Using the Operational Tillage Information System (OpTIS) and the Denitrification–Decomposition (DNDC) Model," *Land*, **9**(11):408; https://doi.org/10.3390/land9110408. (2020). co-authors: SC Hagen, G Delgado, P Ingraham, I Cooke, R Emery, JP Fisk, L Melendy, T Olson, S Patti, N Rubin, B Ziniti, H Chen, W Salas, P Elias.

"Beware humanity's growing use of nitrogen in fertilizers." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, January 31, 2020.

"Carbon Atoms Are Forever. And in the form of soil organic matter, might be Mother Earth's best friend." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, December 27, 2019.

"United We Stand. Divided We Drown. The region is split on climate responses, but collaboration remains possible." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, October 31, 2019.

"'Climate Privilege' – defined and dethroned. Wealth is a key ingredient of global warming. But it's the poor who suffer." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, October 4, 2019.

"'The Big Climate Short.' Any takers? Global-warming skeptics could rake in profits by betting scientists are wrong." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, July 28, 2019.

"Too wet to plant. Now what? Use of cover crops can make soil more resilient to drought and floods." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, June 16, 2019.

"Opportunity knocks. Who will answer? Scientist and former climate-change skeptic explains global-warming reality." Guest Column, *St. Louis Post-Dispatch*, St. Louis, MO, May 23, 2019.

"Agriculture and Pollution: Sharing the Crowded Two-Way Street," book chapter in *Population, Agriculture and Biodiversity: Problems and Prospects*, pp 339-364. P Gustafson, P Raven, P Ehrlich, Ed,'s. (2019). University of Missouri Press. co-author: RL Jones.

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"Income Growth and Climate Change Effects on Global Nutrition Security to Mid-Century," *Nature Sustainability*, 1 (12). doi:10.1038/s41893-018-0192-z. (2018). co-authors: GC Nelson, J Bogard, K Lividini, J Arsenault, M Riley, T Sulser, D Mason-D'Croz, B Power, M Herrero, K Wiebe, K Cooper, R Roseline, M Rosegrant.

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"Multi-Indicator Sustainability Assessment of Global Food Systems," *Nature Communications*, **9**:848 DOI: 10.1038/s41467-018-03308-7 (2018). co-authors: A Chaudhary, A Mathys.

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"Modelling Sustainable Nutrition Security," book chapter in *Sustainable Nutrition in a Changing World*, pp 43-57 (2017). HK Biesalski, A Drewnowski, JT Dwyer, S Strain, Ed.'s: Springer-Verlag, https://link.springer.com/chapter/10.1007/978-3-319-55942-1_4.

"Greenhouse Gas Emissions and Irrigation Water Use in the Production of Pulse Crops in the United States," *Cogent Food & Agriculture* (2017), **3**:1334750. DOI 10.1080/23311932.2017.1334750.

"Crop Health and its Global Impacts on the Components of Food Security," *Food Security*, March 2017. DOI: 10.1007/s12571-017-0659-1 (2017). co-authors: S Savary, S Bregaglio, L Willocquet, D Mason-D'Croz, A Sparks, N Castilla, A Djurle, C Alline, M Sharma, V Rossi, L Amorim, A Bergamin, J Yuen, P Esker, N McRoberts, J Avelino, E Duveiller, J Koo, K Garrett.

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"Pharaoh's Dream Revisited: An Integrated U.S. Midwest Field Research Network for Climate Adaptation," *BioScience* **66**:80-85 (2016). http://bioscience.oxfordjournals.org/content/66/1/80.full co-authors: M Hayes, E Janssen, DB Lobell, S Long, GC Nelson, HB Pakrasi, P Raven, GP Robertson, R Robertson, D Wuebbles.

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"Extreme weather and resilience of the global food system (2015). Final Project Report from the UK-US Taskforce on Extreme Weather and Global Food System Resilience," The Global Food Security Programme, London, UK, 84 pp. co-authors: R Bailey, TG Benton, A Challinor, J Elliott, B Hiller, M Jahn, A Jones, C Kent, K Lewis, T Meacham, M Rivington, D Robson, JR Tiffin, D Wuebbles.

"Analyzing Correlations Between Stream Benthic Macroinvertebrate Community Structure, Water Quality, and Watershed Land Use in the Continental United States," *Biological Engineering Transactions* 7(4):169-182. doi:10.13031/bet7.10700. (2015). co-authors: HN Sandefur, E Cummings, RZ Johnston, MD Matlock.

"Sustainable Nutrition Security: the Role of Food Systems," ILSI Research Foundation, Center for Integrated Modeling of Sustainable Agriculture and Nutrition Security. Washington, DC: http://bit.ly/1MeUN2t (2014). DOI: 10.13140/RG.2.1.1484.9687. co-authors T Acharya, J Fanzo, J Ingram, B Schneeman, L Allen, K Boote, A Drewnowski, F Ewert, S Hall, P Hendley, M Howden, S Janssen, J Jones, M Latulippe, H Lotze-Campen, J

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"Climate Adaptation Imperatives: Untapped Global Maize Yield Opportunities," *Int. J. Agric. Sustain.*, DOI 10.1080/14735903.2013.867694 (2014). co-authors: JW Jones, CH Porter, G Hyman, MD Edgerton, T Gocken, J Shryock, M Doane, K Budreski, C Stone, D Healy, N Ramsey.

"Climate Change Mitigation and Adaptation: Continued Innovation in Agriculture is Essential," *In Vitro Cellular & Developmental Biology Animal*. 50 (Suppl. 1): S3 (2014). co-author: MA Hall.

"Climate Adaptation Imperatives: Global Sustainability Trends and Eco-Efficiency Metrics in Four Major Crops: Canola, Cotton, Maize, and Soybeans," *Int. J. Agric. Sustain.*, DOI: 10.1080/14735903.2013.846017 (2013). co-authors: J Shryock, M Doane, M Matlock, D Zilberman, M Collins, J Fry, S Smith, N Ramsey.

"Preparing the Nation for Change: Building a Sustained National Climate Assessment Process," US National Climate Assessment and Development Advisory Committee, US Global Change Research Program, Washington, DC, 73 pp. (2013). co-authors: J Buizer, P Fleming, S Hays, K Dow, C Field, A Luers, R Moss, M Black, G Lough, S Moser, T Richmond, A Waple.

"US Food Security and Climate Change: Agricultural Futures," US Economics Discussion Papers, No 2013-17, Kiel Institute for the World Economy. http://www.economics-ejournal.org/economics/discussionpapers/2013-17. (2013). co-authors: ES Takle, R Beachy, GC Nelson, D Mason-D'Croz, and A Palazzo.

"Updated Empirical Model of Genetically-Modified Maize Grain Production Practices to Achieve European Union Labeling Thresholds," *Crop Sci*, **53**:1712–1721 (2013). co-authors: A Marceau, IO Brants, F Leprince, X Foueillassar, L Riesgo, F-J Areal, S Sowa, J Kraic, EM Badea.

"Climate Change Impacts on Agriculture: the Monsanto Fellows Panel Report," Proceedings of the Canadian Weed Science Society, *Topics in Canadian Weed Science*, (2012).

"Climate Change: a Crop Protection Challenge for the 21st Century," *Pest Management Science*, **67**:691-696 (2011).

"Response to Comments by DiGiovanni and Kevan on 'Session V: Estimating Likelihood and Exposure,' by Zaida Lentini, *Environ. Biosafety Res*. 5 (2006) 193-195", *Environ. Biosafety Res,* **8**:111-113 (2008).

"Sustainable Use of Glyphosate in North American Cropping Systems," *Pest Mgt Sci.* **64**:409-16 (2008).

"Modeling the Impact of Alternative Hosts and Pyrethroid Sprays on *Helicoverpa zea* Adaptation to Bollgard Cotton," *J. Econ. Entomol.*, **99**:2116-2124 (2006). co-authors: MA Caprio, and GP Head.

"Empirical Modeling of Genetically-Modified Maize Grain Production Practices to Achieve European Union Labeling Thresholds," *Crop Sci* **46**:2133–2140 (2006). co-authors: IO Brants, MJ Horak, KM Remund, EW Rosenbaum, and JK Soteres.

"Computer Modelling To Assess The Impact On Water Quality When Introducing Glyphosate-Tolerant Sugar Beet In Europe," in *Genetic Modification in Sugar Beet 2005*, Volume 6 of *Advances in Sugar Beet Research,* co-authors: C Vanbellinghen, KH Carr, B Coyette, CA Gustin (2005).

"Missing Link?: Alachlor and Semen Quality." Letter to editor of *Environ. Health Perspect*. 113, 652 (2005).

"Applicator Exposure to Acetochlor Based on Biomonitoring." *Regulat. Toxicol. Pharmacol*. 43:141-149 (2005). co-authors: CA Gustin, SJ Moran, JD Fuhrman, ML Kurtzweil, JM Kronenberg, and MA Marshall.

"The Acetochlor Registration Partnership Surface Water Monitoring Program for Four Corn Herbicides," *J. Environ. Qual,* **34**:877-889 (2005). co-authors: AG Hackett, SJ Moran, P Hendley, IJ van Wesenbeeck, ND Simmons, AJ Klein, JM Kronenberg, JD Fuhrman, JL Honegger, J Hanzas, D Healy, and C Stone.

"The Acetochlor Registration Partnership State Ground Water Monitoring Program," *J. Environ. Qual*. **34**:793-803 (2005). co-authors: N de Guzman, P Hendley, IJ. van Wesenbeeck AJ Klein, JD Fuhrman, KZ Travis, ND Simmons, WE Teskey and RB Durham.

"The Acetochlor Registration Partnership Prospective Ground Water Monitoring Program." *J. Environ. Qual*. **34**:1004-1015 (2005). co-authors: AC Newcombe, JD Fuhrman , IJ van Wesenbeeck, ND Simmons, AJ Klein, and K Harradine.

"An Empirical Model for Pollen-Mediated Gene Flow in Wheat," *Crop Sci* **45**:1286-1294 (2005). co-authors: MJ Horak, CB Rempel, SG Metz, DR Gigax, and P Hucl.

"Fractal-Based Scaling and Scale-Invariant Dispersion of Peak Concentrations of Crop Protection Chemicals in Rivers," *Environ. Sci. &Technol.*, **38**:2995-3003 (2004). co-authors: KH Carr, TR Green, CA Gustin, RL Jones, RP Richards.

"Activated Carbon Adsorption of Chloroacetanilide Herbicides and their Degradation Products from Surface Water Supplies," *AQUA: Journal of Water Supply: Research and Technology*, **52**:443-454 (2003) co-authors: KH Carr, DB Carson, JD Fuhrman, AG Hackett, TJ Hoogheem, VL Snoeyink, M Curry, B Heijman, S Chen, P Hertl, IJ van Wesenbeeck.

"Comparison of US EPA's Tier 1 and 2 Index Reservoir Model Estimates to Drinking Water Reservoir Monitoring Results in Selected US Systems in 1999/2000." 10th International Congress Pesticide Chemistry, Basel, August 2002. in Book of Abstracts, vol. 2, p 125 (2002). co-authors: P Hertl, SH Jackson, RL Jones, MH Russell, MJ Schocken, WA Phelps.

"Fractal-Based, Scale-Dependent Models for Characterizing Peak Concentrations of Crop Protection Chemicals in Surface Waters." 10th International Congress Pesticide Chemistry, Basel, August 2002. in Book of Abstracts, vol. 2, p 123 (2002). co-authors: KH Carr, CA Gustin.

"Computer Modelling of Global Efforts to Reduce Off-Site Impacts of Crop Protection Chemicals Through the Adoption of Transgenic Cropping Systems." 10th International Congress Pesticide Chemistry, Basel, August 2002. in Book of Abstracts, vol. 2, p 124 (2002). co-authors: B Coyette, KH Carr, CA Gustin.

SELECTED PUBLICATIONS (*continued*)

"Removal of Chloroacetanilide Herbicides and Their Degradation Products from Surface Water Supplies Using Powdered Activated Carbon." 10th International Congress Pesticide Chemistry, Basel, August 2002. in Book of Abstracts, vol. 2, p 122 (2002). co-authors: KH Carr, DB Carson, JD Fuhrman, AG Hackett, TJ Hoogheem, VL Snoeyink, M Curry, B Heijman, IJ van Wesenbeeck.

"Stewardship Programs to Reduce Off-Target Movement of Glyphosate." 10th International Congress Pesticide Chemistry, Basel, August 2002. in Book of Abstracts, vol. 2, p 106 (2002). co-authors: B Cambon, B Coyette, MA Reding.

"Predicted Impact of Transgenic, Herbicide-Tolerant Corn on Drinking Water Quality in Vulnerable Watersheds of the Midwestern United States," *Pest Mgt Sci*, 58:146-160 (2002). co-authors: RD Wauchope, TL Estes, R Allan, JL Baker, AG Hornsby, RL Jones, RP Richards.

"Predicted Impact of Transgenic Cropping Systems on Water Quality and Related Ecosystems in Vulnerable Watersheds of the United States," 2001 BCPC Symposium Proceedings No. 78: Pesticide Behaviour in Soils and Water, British Crop Protection Council, Brighton, UK, pp. 357-366 (2001) co-authors: TL Estes, R Allan, RL Jones, DR Buckler, KH Carr, CA Gustin, MJ McKee, AG Hornsby, RP Richards.

"Tiered Approach for Ground Water Study Requirements," CRC Publications, (2001).

"A Tiered Approach for Ground Water Study Requirements in the United States," First International Conference on the Behaviour of Pesticides in Soils, Ground and Surface Water, Die Akademie Fresnius GmbH, Proceedings (1999).

"New Uses for Information Technology in Global Product Stewardship," IBC International Symposium, London, UK, September 26, 1997, Proceedings (1997).

"Current State of Modeling to Predict Leaching and Run-Off Potential," IBC International Symposium, London, UK, September 25, 1996, Proceedings (1996).

"Further Development of TA-DA!: A New Geographically-Based Probabilistic Modeling System," COST International Symposium, Warwick, United Kingdom, May 15, 1996, Proceedings (1996).

"Predicting Surface and Ground Water Contamination by Agricultural Chemicals - Models Versus Monitoring," IBC International Symposium on Computer Modeling Of Agricultural Chemical Fate in the Environment, London, UK, June 9, 1994, Proceedings (1994).

"New Advances in Predicting Pesticide Fate and Transport," COST International Symposium, Brussels, Belgium, April 29, 1994, Proceedings (1994).

"Effect of Nonlinear Dissipation Kinetics on the Predictions of Environmental Fate Models," submitted to *J. Environ. Toxic. & Chem* (1994).

"Advantages and Potential Pitfalls in the Use of Models for Regulatory Control of Pesticide Usage," Brighton Crop Protection Conference, Brighton, UK, Proceedings (1993).

SELECTED PUBLICATIONS (*continued*)

"Use of Computer Models to Assess Exposure to Agricultural Chemicals via Drinking Water," The Science of the Total Environment, **171**:35-42 (1995).

"Pesticides in Drinking Water," John Wiley & Sons, New York, 241 pp, (1993).

"Development of Novel Active Ingredients," in *Risk of Pesticides in Groundwater*, ed. Enzo Funari, National Institute of Health, Italy (1993).

"Computer Modeling Applications in Environmental Assessments: Predicting Movement of Pesticides into Drinking Water," in Reviews of Environmental Toxicology, ed. R. Michael Roe, North Carolina State University (1993).

"Use of Soil Property Data and Computer Models to Minimize Agricultural Impacts on Water Quality," *Proceedings, Soil Specific Crop Management*, University of Minnesota, Bloomington, MN, April 14-16 (1992).

"Recommended Approaches to Assess Pesticide Mobility in Soil," GIFAP Soil Mobility Sub-Group Report, February 28 (1992).

"In Search of Environmental Friendliness: Screening and Modeling Techniques for Assessing the Potential for Ground and Surface Water Contamination by Herbicides," *Proceedings, 8th Symposium on Herbicides*, Piacenza, Italy, June 11-12 (1991).

"Field Calibration of SURFACE: A Model of Agricultural Chemicals in Surface Waters," *J. Environ. Sci. Health*, **B25**:665-687 (1990).

"Nonlinear Pesticide Dissipation in Soil: A New Model Based on Spatial Variability," *Environ. Sci. &Technol.*, **24**:1032-1038 (1990), co-author: LR Holden.

"Controlled Delivery and Soil Applications," in *Controlled Delivery of Crop Protection Agents*, ed. R. M. Wilkins, Taylor and Francis Ltd., pp. 23-42 (1990).

"Groundwater Ubiquity Score: A Simple Method for Assessing Pesticide Leachability," *J. Environ. Toxic. &Chem.*, **8**:339-357 (1989).

"Modeling Root Zone Dispersion: A Comedy of Error Functions," *Chem. Eng. Comm.*, **73**:77-94 (1988).

"Accuracy of Predictive Water Quality Models -- Comparison with Measured Surface Water Concentrations of Crop Chemicals in Northern Ohio," *J. Environ. Toxic. &Chem.*, **7**:261-262 (1988).

"Modeling of Pesticide-Soil Interactions: A New Tool in Formulation Optimization," in Controlled Release of Bioactive Materials, 12th International Symposium, pp. 263-264 (1985).

"Controlled Release Animal Repellents in Forestry," in Bioactive Polymeric Systems, eds. C.G. Gebelein and C.E. Carraher, Plenum Publ., pp. 179-201 (1985).

"The Reduction of Deer Browsing of Douglas-fir (*Pseudotsuga menziesii*) Seedlings by Quadrivalent Selenium," Forest Ecol. Mgt., 7:163-181 (1984).

SELECTED PRESENTATIONS

"Recommendation: Embrace the Possibility of Multi-Model Ensemble Approaches to Soil Carbon and GHG Emissions," 2024 International SWAT Conference, Strasbourg, France, July 2024.

"Use of Machine Learning to Process Satellite Imagery and Thereby Create Tools for Tracking National Progress in the Adoption of Sustainable Agricultural Practices," American Geophysical Union, San Francisco, CA, December 2023.

"Using Remote Sensing and Biogeochemical Modeling to Track Progress and Outcomes from Climate-Smart Agriculture with a CONUS-Wide Monitoring Product," Tri-Society Annual Meeting, St. Louis, MO, November 2023.

"Pursuing a Multi-Model Ensemble Approach to Soil Carbon in Agricultural Systems," 2023 Annual Meeting of the European Geophysical Union, Vienna, Austria, April 2023.

"The Essential Role of the Food Industry in Making Healthy, Sustainable Diets Available to Everyone," 2022 Korean Society of Food Science and Technology (KoSFoST) International Symposium and Annual Meeting, Busan, South Korea, July 2022.

"Fruit and Vegetable Food Systems: Climate Adaptation and Mitigation Opportunities," Technical University of Munich, Germany, April 2022.

"Carbon Market Opportunities for Fruit and Vegetable Growers," on-line F&V-CAMO Webinar Series (https://foodsystems.org/event/fvcamo-2022/), March 2022.

"Climate Adaptation and Mitigation Opportunities in Fruit and Vegetable Supply Chains: Key Findings," on-line F&V-CAMO Webinar Series (https://foodsystems.org/event/fvcamo-2022/), March 2022.

"Climate Change," Washington State University, Pullman, WA, December 2021.

"Introduction to OpTIS 2.0: A New Version of the Operational Tillage Information System," InfoAg Conference, St. Louis, MO, August 2021.

"Integrated Approach to Climate Adaptation and Mitigation: Application to Fruit & Vegetable Supply Chains," American Geophysical Union, virtual conference, December 2020.

"Climate Adaptation and Mitigation Opportunities in Fruit and Vegetable Supply Chains," American Geophysical Union, San Francisco, CA, December 2019.

"OpTIS (Operational Tillage Information System): Using Remote Sensing Data to Map Conservation Ag Practices," Coalition on Agricultural Greenhouse Gases, Sacramento, CA, April 2019.

"N-Gage: A New Method for Incentivizing Water Quality Improvement," National Water Quality Monitoring Conference, Denver, CO, March 2019.

"Food System Performance Metrics to Improve Health and Sustainability Outcomes," 3rd Agriculture and Climate Change Conference, Budapest, Hungary, March 2019.

"Food System Innovations for Sustainable Nutrition," Nutrition 2018, Paris, France, November 2018.

"Pursuing More Fruitful Food Systems," Washington State University, Pullman, WA, September 2018.

"What is Sustainable Nutrition? Can it be measured and enhanced?" Korea Nutrition Society Symposium on Sustainable Nutrition, Seoul, South Korea, May 2018.

"Food System Metrics for Sustainable Nutrition," Belt & Road High Level Meeting for Health Cooperation: Towards a Health Silk Road, Beijing, China, August 2017.

"CIMSANS Model of Public-Private Collaboration in Food Systems," Nutrition Impact Summit, Dallas, TX, September 2016.

"Expanding the Impact of Open Data via Modeling of Global Nutrition Security," 2016 GODAN Open Data Summit, New York, NY, September 2016.

"Modeling Nutrition and Sustainability Outcomes in Food Systems: The Role of Metrics," 2016 Korean Society of Food Science and Technology (KoSFoST) International Symposium and Annual Meeting, Daegu, South Korea, August 2016.

"Climate Change and the Change it's Driving," Illinois Ag Leadership Conference, Chicago, IL, July 2016.

"Food System Metrics for Quantifying Nutrition and Sustainability Outcomes," 6th AgMIP Global Workshop, Montpellier, France, June 2016.

"Achieving Sustainable Nutrition Security: The Essential Role of Partnerships," Experimental Biology, American Society of Nutrition, San Diego, CA, April 2016.

"Future Shock Now: Current Climate Change Impacts on the Agri-Food System," North Central Weed Science Society of America, Indianapolis, IN, December 2015.

"Enhancing Food System Resilience: Policy Options," guest lecture at Johns Hopkins School of Advanced International Studies, Global Environmental Fundamentals, November 2015.

"Assessing Sustainable Nutrition Security: Including Fruits and Vegetables," joint Tri-Society/Entomology annual meeting, Minneapolis, MN, November 2015.

"Sustainable Nutrition Security: Collaboration Opportunities," ILSI Argentina, Buenos Aires, October 2015.

"Climate Change Impacts to Sustainable Nutrition Security," International Plant Molecular Biology 2015 Congress in Iguazu Falls, Brazil, October 2015.

"Global Food Security: Nutrition & Sustainability Outcomes in Food Systems," guest lecture at Johns Hopkins School of Advanced International Studies, Global Environmental Fundamentals, October 2015.

SELECTED PRESENTATIONS (*continued*)

"Reshaping Food Systems to Achieve Sustainable Nutrition Security: The Unique Role of Public-Private Partnerships," Global Dialogue Series, The Future of Food, University of British Columbia, Vancouver, BC, December, 2014.

"Planet Dearth: Climate-induced famine – Can we avoid it?," Guest Lecture, UW Nutritional Sciences Program, NUTR 490/500, Sustainable Food & Nutrition Security, University of Washington, Seattle, WA, December 2014.

"Assessing Sustainable Nutrition Security: The Role of Food Systems," ARD2014, 2nd International Conference on Agricultural and Rural Development in Southeast Asia, Manila, Philippines, November, 2014.

"Integrated Modeling: Adapting Food Systems to Accelerating Global Change," Workshop on Climate Change and Agriculture in the Midwest, Washington University, St. Louis, MO, September 2014.

"Climate Change: Impact on Energy Resources," Chicago, Illinois, July 2014.

"Overview of Climate Change: Causes, Consequences, and their Mitigation," International Conference on Climate Change and Implications for Water Resources & Nutrition Security, Bangalore, India, November 2013.

"X-Farming: Coming to a Planet Near You," University of Illinois, November 2013.

"Sustainable Nutrition Security: What is it?" First International Conference on Global Food Security, Noordwijkerhout, The Netherlands, October 2013.

"Major Benefits of Sustainable Intensification of Maize Cropping Systems: Productivity, Environmental, And Economic," First International Conference on Global Food Security, Noordwijkerhout, The Netherlands, October 2013.

"The Third US National Climate Assessment," National Association of Clean Air Agencies, St, Louis, MO, May 2013.

"Climate Change and Food Security Imperative: Collaborate or Starve!," Sustaining Economies and Natural Resources in a Changing World, University of Florida, Gainesville FL, April 2013.

"The National Climate Assessment: Overview," Society for Range Management, Oklahoma City, OK, February 2013.

"Private Sector Contributions Toward Improved Drought Resilience," 18th session of the Conference of the Parties to the UNFCCC and the 8th session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (COP18/CMP8), Doha, Qatar, November 2012.

"Low Carbon Intensity Corn Ethanol: New Pathways Based on Sustainable Stover Utilization," LCA XII, Tacoma, WA, September 2012.

"Farming a Warming Planet: 2030 and Beyond," Monsanto Fellows in Plant Breeding Symposium, Ankeny, IA, September 2012

"Improved Climate Resilience of US Corn," NOAA Climate Predictions Applications Science Workshop, Miami, FL, March 2012.

"Challenges in Modeling of Agricultural Systems," DOE/Industry Modeling & Simulation Workshop, Austin, TX, March 2012.

"Climate Impacts on Agriculture," USDA Agricultural Outlook Forum, Arlington, VA, February 2012.

"Climate Change in the Great Plains," Great Plains Land Expo, Fargo, ND, November 2011.

"Climate Change and Agriculture: Conclusions of a Monsanto Fellows Panel," Fourth International Maize Forum, Sinaloa, Mexico, October 2011.

"Bioenergy Buffers – Creating Sustainable Agricultural Landscapes," American Chemical Society, Denver, CO, August 2011.

"Advancing the Science of Modeling: Industry Perspectives," invited plenary lecture, Modeling Summit, Soil & Water Conservation Society, Denver CO, March 2011.

"Sustainable Intensification of Agricultural Productivity via New Germplasm, New Practices, and New Technology," invited lecture, International Life Sciences Institute, Orlando, FL, January 2011.

"Going from None to Giga-Tons of Biomass in Twenty Years – The Monsanto Experience," invited plenary lecture, "Algae Biomass Summit, Phoenix, AZ, September 2010.

"Climate Change: a Crop Protection Challenge for the 21st Century," invited plenary lecture, International Union of Pure & Applied Chemistry (IUPAC) Pesticide Congress, Melbourne, Australia, July 2010.

"Challenges of Developing a Holistic Indicator of Agricultural Impacts," invited lecture, International Union of Pure & Applied Chemistry (IUPAC) Pesticide Congress, Melbourne, Australia, July 2010.

"Bioenergy Buffers – Creating a Sustainable Agricultural Landscape," International Union of Pure & Applied Chemistry (IUPAC) Pesticide Congress, Melbourne, Australia, July 2010.

"Climate Change and the Impact on the Future of Agriculture," invited plenary lecture, Canadian Weed Science Society, Charlottetown, Prince Edward Island, Canada, November 2009.

"A Monsanto Perspective on the New Environmental Challenges of the 21st Century," invited lecture, A Sense of Wonder: An Evening with Rachel Carson, Powder Valley Nature Recreation Center, Missouri Department of Conservation, Kirkwood, MO, March 2009.

"A Monsanto Perspective on the Climate Change Challenge," invited plenary lecture, Missouri Natural Resources Conference, Tan-Tar-A Resort, Osage Beach, MO, February 2009.

"Cumulative Global Impacts and Future Potential of Roundup Ready Technology to Improve Water Quality Metrics and the Sustainability of Agricultural Systems," FAO/IAEA Symposium: Assessing the Impact of Soil and Land

Management Practices on the Fate of Agrochemicals and their Residues within Agricultural Ecosystems Using Nuclear and Related Techniques, Vienna, Austria, December 2008.

"Pre-Serve: Monsanto's Glyphosate Endangered Species Initiative," State FIFRA Issues Research & Evaluation Group (SFIREG) Working Committee pesticide Operations Management (POM), Boise, ID, October 2008.

"Sustainable Management of Glyphosate-Resistant Weeds in Roundup Ready® Cropping Systems," North Central Weed Science Society, St. Louis, MO, December 2007.

"New Agricultural Technologies and Climate Change," invited keynote lecture, Practical Paths 2007, Idaho Council for Industry and the Environment, Boise, ID, October 2007.

"Sustainable Use of Glyphosate in North American Cropping Systems," invited lecture, American Chemical Society, Chicago, IL, March 2007.

"Measured Impact of Herbicide Tolerant Corn on Occurrence of Conventional Corn Herbicides in Surface Water," poster, American Chemical Society, Chicago, IL, March 2007, co-author: KH Carr.

"Recent Findings on the Field Behavior, Genetics, and Mechanism of Glyphosate-Resistance in Horseweed," invited lecture, Northeast Weed Science Society, Baltimore, MD, January 2007.

"Empirical Modeling of Genetically-Modified Maize Grain Production Practices to Achieve European Union Labeling Thresholds," invited lecture, International Symposium on Biosafety of Genetically-Modified Organisms, Jeju, South Korea, September 2006.

"Challenges to Modeling the Selection and Spread of Glyphosate-Resistant Weeds," invited lecture, American Chemical Society, September 2006.

"Glyphosate Efficacy: Resistance is Futile … or is it?," invited lecture, Faculty of Agriculture, Hebrew University of Jerusalem, Rehovot, Israel, April 2006.

"Co-Existence and Resistance: New Challenges for Modeling of Agricultural Systems," invited lecture, Aspects of Co-Existence in the New Agricultural Ecosystem, Universita Cattolica del Sacro Cuore, Piacenza, Italy, March 2006.

"Modeling the Potential Impact of Herbicide-Tolerant Crops on Pesticide Concentrations in Fifteen Large European Rivers," Pesticide Behaviour in Soils, Water and Air, University of Warwick, Coventry, UK, March 2006.

"Predicting the Environmental Impact of Molecules," ACS National Meeting, Sand Diego, CA, March 2005.

"Fractal-Based Scaling and Scale-Invariant Dispersion of Peak Concentrations of Crop Protection Chemicals in Rivers," ACS National Meeting, Philadelphia, PA, August 2004.

"Investigation into a Urinalysis Interferrent of Alachlor," 9th Symposium on the Chemistry and Fate of Modern Pesticides, Vail, CO, August 2004.

"A New, Scale-Dependent Model for Peak Pesticide Concentrations in Rivers," EU Modeling Workshop, Catania, Italy, February 2004.

"A New, Scale-Dependent Model for Peak Pesticide Concentrations in Rivers," invited lecture, Uppsala University, Uppsala, Sweden, September 2003.

"Global Water Quality Research Initiatives at Monsanto," invited lecture, Washington University, September 2002.

"Global Water Quality Research Initiatives at Monsanto," invited lecture, USDA, Tifton, GA, June 2002.

"Predicted Impact of Transgenic Crops on Water Quality And Related Ecosystems In Vulnerable Watersheds Of The United States," National Water Quality Modeling Conference, Madison, WI, May 2002.

"Predicted Impact of Transgenic Cropping Systems on Water Quality and Related Ecosystems in Vulnerable Watersheds of the United States," Soil and Water Mini-Symposium, Brighton Crop Protection Council, Brighton, UK, November 2001.

"Strategies for Making the Best Use of Post-Registration Water Monitoring," Third International Conference on the Behaviour of Pesticides in Soils, Ground and Surface Water, Die Akademie Fresnius GmbH, Bonn, Germany, September 11, 2001.

"Precision Agriculture: The Future of Crop Production?" IBC International Symposium, London, UK, March 12, 2001.

"Water Quality Impacts of Transgenic Crops," Clarkson University, Potsdam, NY, September 12, 2000.

"Agricultural Technology: Are GMO's Better Than Existing Crops?" Gordon Conference, Lebanon, NH, June 9, 2000.

"Providing 'Reliable Information' under FQPA. Part I: Use of ARP Surface Water Monitoring Data for Chronic and Acute Aggregate Exposure Assessments," American Chemical Society, New Orleans, LA, August 26, 1999 (co-authors Amy Hackett, Larry Holden and Kirk Remund).

"Providing 'Reliable Information' under FQPA. Part II: Development of a Surface Water Exposure Assessment Model from ARP Monitoring Results," ," American Chemical Society, New Orleans, LA, August 26, 1999 (co-authors Amy Hackett, Larry Holden and Kirk Remund).

"A Tiered Approach for Ground Water Study Requirements in the United States," First International Conference on the Behaviour of Pesticides in Soils, Ground and Surface Water, Die Akademie Fresnius GmbH, Darmstadt, Germany, June 21, 1999.

"Tiered Approach for Ground Water Study Requirements," American Chemical Society, Boston, MA, August 25, 1998.

"New Practices and New Technologies for Global Product Stewardship and Water Quality Protection in Agriculture," Sustainability Workshop, San Jose, Costa Rica, January, 1998 (co-authors Steve Adams, Diane Goertz, Tom Hoogheem, and Martin Lemon).

"New Uses for Information Technology in Global Product Stewardship," IBC International Symposium, London, UK, September, 1997.

"A New Initiative on the Use of GIS/GPS in Precision Agriculture," GIS/GPS '97, Annapolis, MD, May, 1997.

"Current State of Modeling to Predict Leaching and Run-Off Potential," IBC International Symposium, London, UK, September, 1996.

"Further Development of TA-DA!: A New Geographically-Based Probabilistic Modeling System," COST International Symposium, Warwick, United Kingdom, May 1996.

"Deriving Competitive Advantage Through GIS," Interchange'95, America's Center, St. Louis, MO, December 1-5, 1995.

"GIS-Based, Probabilistic Modeling of Crop Chemicals in the Environment," ASAE Symposium on Geographic Information Systems, Atlanta, GA, December 1994.

"Regression Modeling of Atomization for Typical Agricultural Nozzles," ASAE Symposium on the Modeling and Prediction of Spray Drift from Agricultural Chemical Applications, Atlanta, GA, December 1994.

"TA-DA!: A New Geographically-Based, Probabilistic Exposure Modeling System for Crop Chemicals in the Environment," IUPAC International Symposium on Modeling of Pesticides in the Environment, Washington, DC, July 8, 1994.

"Predicting Surface and Ground Water Contamination by Agricultural Chemicals - Models Versus Monitoring," IBC International Symposium, London, UK, June 9, 1994.

"New Advances in Predicting Pesticide Fate and Transport," COST International Symposium, Brussels, Belgium, April 29, 1994.

"Advantages and Potential Pitfalls in the Use of Models for Regulatory Control of Pesticide Usage," Brighton Crop Protection Conference, Brighton, UK, November 25, 1993.

"Effect of Nonlinear Dissipation Kinetics on the Predictions of Environmental Fate Models," SETAC Annual Meeting, Houton, TX, November 18, 1993.

"Use of Computer Models to Assess Exposure to Agricultural Chemicals via Drinking Water," SECOTOX Regional Meeting, Rome, Italy, September 27, 1993.

"Monitoring Drinking Water for Residues of Aldicarb and Asulam in Florida: 1992 Update," Florida Pesticide Residue Workshop, St. Petersburg, FL, July 22, 1992.

"Use of Soil Property Data and Computer Models to Minimize Agricultural Impacts on Water Quality," Soil Specific Crop Management, University of Minnesota, Bloomington, MN, April 15, 1992.

SELECTED PRESENTATIONS (*continued*)

"Industry Perspective of Model Technology and Uses," Conservation Technology Information Center Workshop, Washington, DC, April 8, 1992.

"Industry Perspective on Computer Model Technology and Uses," North Carolina State University, Raleigh, NC, March 26, 1992.

"In Search of Environmental Friendliness: Screening and Modeling Techniques for Assessing the Potential for Ground and Surface Water Contamination by Herbicides," 8th Symposium on Herbicides, Piacenza, Italy, June 11, 1991.

"The Three W's of Agricultural Chemicals in Groundwater: Which ones, Where, and Why," Water Quality Symposium at the North Central Agronomy Meetings, Columbia, MO, June 29, 1989.

"A Simple Graphical Method for Assessing Pesticide Leachability," Water Quality Seminar Series, University of Missouri, Columbia, MO, August, 1988.

"Groundwater Ubiquity Score: A Simple Method for Assessing Pesticide Leachability," International Water Quality Modeling Symposium, Logan, UT, June 20-24, 1988.
"Use of Vadose Zone Models in Education," Agricultural Research Institute Workshop, Annapolis, MD, November 2, 1987.

"A Comparison of Surface Water Monitoring Results with Predictions of Various Models," Water Quality Workshop, Heidelberg College, Tiffin, OH, October 24, 1987.

"Modeling Root Zone Dispersion: A Comedy of Error Functions," American Institute of Chemical Engineers, Minneapolis, MN, August 17, 1987.

"Field Calibration of SURFACE: A Model of Agricultural Chemicals in Surface Waters," American Chemical Society, Denver, CO, April 9, 1987.

"Assessment of HSPF and other Techniques for Modeling Surface Water Concentrations of Agricultural Chemicals," EPA/NACA Workshop on Computer Modeling of Agricultural Chemical Transport to Groundwater and Surface Water, Washington, DC, December 5, 1985.

AWARDS, HONORS

Appointed to the Science Advisory Council of Earth Knowledge, 2025.
Elected to the Board of Directors of the Agricultural Innovation Institute, 2025.
Re-appointed to the Field to Market Technical Advisory Committee, 2025.
Elected to the Field to Market Metrics Committee, 2024.
Invited chair of USDA/ARS National Program Review Panel, 2023.
Invited by HabiTerre to serve as expert reviewer of its *ecosys* validation report for the Climate Action Reserve (CAR), 2023.
Invited by Indigo Ag to participate in the inaugural Indigo Science & Policy Forum, Boston, Massachusetts, 2022.
Invited by National Science Foundation to serve as peer review panel member, Panel P222446: AI for Climate-Smart Agriculture and Forestry, 2022.
Invited speaker, Korean Society of Food Science and Technology (KoSFoST), Busan, South Korea, 2022.
Invited speaker, Technical University of Munich, Germany, 2022.
Invited guest lecturer, Washington State University, 2021.
Invited speaker, InfoAg, St. Louis, MO, 2021.
Appointed to the Field to Market Technical Advisory Committee, 2021.
Elected Chair of the Board of Directors of Stone Environmental, Inc., 2020.
Invited speaker, Coalition on Agricultural Greenhouse Gases, Sacramento, CA, 2019.
Elected to Board of Directors of Stone Environmental, Inc., 2019.
Invited keynote speaker, 3rd International Conference on Agriculture & Climate Change, Budapest, Hungary, 2019.
Invited keynote speaker, Nutrition 2018, Paris, France, 2018.
Invited chair of USDA/ARS National Program Retrospective Review Panel, 2018.
Invited speaker, Washington State University, 2018.
Invited speaker, Korea Nutrition Society, Seoul, South Korea, 2018.
Invited speaker, Belt & Road High Level Meeting for Health Cooperation: Towards a Health Silk Road, Beijing, China, 2017.
Invited moderator, Experimental Biology, American Society of Nutrition, Chicago, IL, 2017.
Invited speaker, Korean Society of Food Science and Technology (KoSFoST), Daegu, South Korea, 2016.
Winner, *2016 ASABE Superior Paper Award* for "Analyzing Correlations between Stream Benthic Macroinvertebrate Community Structure, Water Quality, and Watershed Land Use in the Continental United States" published in *Biological Engineering Transactions*.
Invited speaker, Experimental Biology, American Society of Nutrition, San Diego, CA, 2016.
Invited session chair, International Plant Molecular Biology 2015 Congress in Iguazu Falls, Brazil, 2015.
Invited keynote speaker, North Central Weed Science Society of America, Indianapolis, IN, 2015.
Invited guest lecturer, Johns Hopkins School of Advanced International Studies, Washington, DC, 2015.
Invited by UNEP to serve as North American Chapter Lead Author in Outlooks section of GEO 6, 2015.
Invited by UK to serve on UK-US Taskforce on Extreme Weather and Global Food System Resilience, 2014.
Invited by Bill & Melinda Gates Foundation to join team defining a new BMGF Grand Challenge: "*NextGen* – Decision Support Infrastructure for Advancing Smallholder Agriculture," 2014.
Invited speaker, ARD2014, 2nd International Conference on Agricultural and Rural Development in Southeast Asia, Manila, Philippines, 2014
Invited keynote speaker, First International Conference on Global Food Security, Noordwijkerhout, The Netherlands, 2013.
Selected as peer reviewer for IPCC Working Group 2 Fifth Assessment Report, 2013.
Elected Chair of Board of Directors, Conservation Technology Information Center, 2013.
Invited speaker, USDA/OCE/ERS 2012 Drought: Experiences and Lessons Learned, Washington DC, 2013.
Invited speaker, NACAA, St. Louis, MO, 2013.

AWARDS HONORS (*continued*)

Invited speaker, USDA Side Event at UNFCCC COP18/CMP8, Doha, Qatar, 2012.
Elected President, St. Louis Reconciliation Network, St. Louis, MO, 2012.
Invited plenary speaker, American Association for the Advancement of Science, Vancouver, BC, 2012.
Selected as member of National Climate Assessment Development & Advisory Committee (NCADAC) by US Department of Commerce, 2011.
Selected as member of NCADAC Executive Secretariat by NOAA, 2011.
Selected as member of Ph.D. Dissertation Review Committee, Mark Henson, Washington University, 2011.
Invited plenary speaker, Soil & Water Conservation Society Modeling Summit, 2011.
Selected to serve as member of Greenhouse Gas Validation/Verification Accreditation Committee (GVAC) of American National Standards Institute (ANSI), 2011.
Invited plenary speaker, Soil and Water Conservation Society (SWCS) Modeling Summit, Denver, CO, 2011.
Invited delegate to The Hague Conference on Agriculture, Food Security, and Climate Change, 2010.
Invited plenary speaker, Algae Biomass Summit, Phoenix, AZ, 2010.
Invited sub-theme chairman and Plenary speaker, IUPAC, Melbourne, Australia, 2010.
Above & Beyond Award, *Over-the-Top Acetochlor Formulation for Soy and Cotton*, 2009.
Elected to Board of Directors, Conservation Technology Information Center, 2009.
Invited keynote speaker, CWSS National Meeting, Prince Edward Island, Canada, 2009.
Invited speaker, ACS National Meeting, Washington, DC, 2009.
I.C.E. Award, *Creation of Encapsulated Acetochlor Formulation for Roundup Ready Soybeans and Roundup Ready Flex Cotton*, Monsanto Technology Chemistry, 2009.
Finalist for 2009 Monsanto Pledge Award, *Protecting Endangered Species through the Glyphosate Endangered Species Initiative*.
Invited speaker, Missouri Department of Conservation, Kirkwood, MO, 2009.
Invited speaker, 2009 Missouri National Resources Conference, Osage Beach, MO, 2009.
Invited speaker, FAO/IAEA Symposium, Vienna, Austria, 2008.
Reggie Award, *Regulatory Innovation: Gaining Reduced Refuge Requirement for MON 89034 in Canada and US*, Monsanto Regulatory, 2008.
Reggie Award, *Existing Products, North America: Glyphosate ESA Assessment and Acetochlor Water Quality Standard*, Monsanto Regulatory, 2008.
Invited speaker, SFIREG/POM Working Committee, Boise, ID, 2008.
Invited member, ASA-CSSA-SSSA working group to evaluate USDA's Climate Change Strategic Plan for Research, Education, and Extension, 2008.
Rapid Recognition Award, *Defense of Acetochlor in Minnesota*, 2008.
Invited keynote speaker, Practical Paths 2007, Boise, ID, 2007.
2006 Monsanto Pledge Award, *Team Ensures Successful Launch of Roundup Ready Flex Cotton*, 2007.
Invited speaker, ACS National Meeting, Chicago, IL, 2007.
Invited speaker, Northeast Weed Science Society Meeting, Baltimore, MD, 2007.
Invited author of a *Perspectives* commentary for journal, *Pest Mgt Sci*, 2006.
Invited speaker, International Symposium on the Biosafety of Genetically Modified Organisms, Jeju Island, South Korea, 2006.
Invited speaker, ACS National Meeting, San Francisco, CA, 2006.
Invited speaker, Faculty of Agriculture, Hebrew University of Jerusalem, Rehovot, Israel, 2006.
Invited speaker, Universita Cattolica del Sacro Cuore, Piacenza, Italy, 2006.
Appointed to Monsanto's Fellow Program Nominations and Promotions Review Committee, 2006-9.
Above & Beyond Award, *Development of a Solution for Necrosis on Roundup Ready Flex Cotton*, 2005.
Invited speaker, ACS National Meeting, San Diego, CA, 2005.
Invited speaker, Uppsala University, Uppsala, Sweden, 2003.

AWARDS HONORS (*continued*)

Named Senior Fellow, Monsanto, 2003.
Invited speaker, Washington University, St. Louis, MO, 2002.
Invited speaker, USDA, Tifton, GA, 2002.
Reggie Award, *Starring Team, North America, Bollgard and YieldGard Re-registration*, Monsanto Regulatory, 2002.
Selected as sole industry representative on European Environmental Independent Expert Group (evaluating issue of glyphosate contamination of drinking water), 2002.
Invited speaker, Third International Conference on the Behaviour of Pesticides in Soils, Ground and Surface Water, Die Akademie Fresnius GmbH, Darmstadt, Bonn, Germany, 2001.
Invited speaker and chairman, IBC International Symposium, London, UK, 2001.
Winner, Life Sciences Excellence Award, *Roundup Ready Corn brings Downstream Benefits,* Monsanto Company, 1999.
Invited speaker, First International Conference on the Behaviour of Pesticides in Soils, Ground and Surface Water, Die Akademie Fresnius GmbH, Darmstadt, Darmstadt, Germany, 1999.
Invited speaker, ACS Symposium on Environmental Modeling, Boston, MA, 1998.
Invited sub-topic chairman, Modeling of Pesticide Fate, IUPAC, London, UK, 1998.
Invited expert panel member, FQPA Drinking Water Exposure, ILSI, Washington, DC, 1997.
Invited keynote speaker and chairman, IBC International Symposium, London, UK, 1997.
Invited speaker, IBC International Symposium, London, UK, 1996.
Nominated for St. Louis Academy of Science Innovation Award, 1995.
Invited peer review panel member, NASA/AIBS, Reston, VA, June 26-29, 1994.
Invited chairman, American Chemical Society, Agrichemicals, Washington, DC, 1994.
Invited keynote speaker, IBC International Symposium, London, UK, 1994.
Invited speaker and chairman, COST International Symposium, Brussels, Belgium, 1994.
Elected Science Fellow, Monsanto Agricultural Group, 1993.
Invited speaker, Brighton Conference, Brighton, UK, 1993.
Invited keynote speaker, SECOTOX Regional Meeting, Rome, Italy, 1993.
Monsanto Agricultural Company Achievement Award, 1989.
Pennwalt Award, Outstanding Paper, Controlled Release Society, 1983.
President, Tau Beta Pi Engineering Honor Society, Univ. of Wash., 1982-1983.
President, Alpha Delta Phi Literary Society, Stanford University, 1979-1980.
President, Senior Class, Joel E. Ferris High School, Spokane, WA, 1975-1976.

ADDITIONAL TRAINING

"Global Trade & Analysis Program: GTAP," Purdue University, West Lafayette, IN, August 6-10, 2011.

"Introduction to FIFRA," Keller & Heckman, Washington, DC, October 23-24, 2007.

"Good Laboratory Practice Standards," Quality Associates, Inc., Elgin, IL, May 9, 1998.

"FIFRA Exposure Modeling Workshop," Waterborne Environmental, Inc., St. Louis, MO, July 17-18, 1997.

"AGDRIFT Spray Drift Model," Spray Drift Task Force, St. Louis, MO, June 10, 1997.

"Optimizing Management for Precision Farming: A Systems Approach," University of Florida, Gainesville, FL, March 10-15, 1997.

"Introduction to ArcView3 GIS and Imagine Software," Southern Illinois University, Edwardsville, IL, February 9-10, 1997.

"Fundamentals of Hydrogeology," University of Wisconsin, Madison, WI (video-link), January 24-February 28, 1995.
"Nonlinear Analysis of Data," University Associates, St. Louis, MO, February 14-18, 1994.

"Computer System Validation in a Regulatory Environment," The Raskasky Group, Orlando, FL, October 29-30, 1992.

"Writing for Business and Industry," Communication Constructs, Research Triangle Park, NC, October 21-22, 1992,

"Compliance with EPA's Good Laboratory Practice Requirements in Registration Studies," Dexter S. Goldman, Inc., Research Triangle Park, NC, July 13-15, 1992.

"Pesticides and Groundwater," Environmental Chemistry Institute, Washington, DC, May 12, 1992.

"Soil Specific Crop Management," University of Minnesota, Bloomington, MN, April 14-16, 1992.

"How to Manage Projects," SkillPath, Inc., Research Triangle Park, NC, November 26, 1991.

"Fate and Transport of Chemicals in the Subsurface," US Environmental Protection Agency, Kansas City, MO, January 11-12, 1988.

"Chemodynamics: Fate and Transport of Chemicals in the Environment," AIChE Continuing Education Series, Minneapolis, MN, August 14-15, 1987.

"Introduction to Biotechnology and Bioprocesses," AIChE Continuing Education Series, St. Louis, MO, August 28-31, 1986.

"Computer Modeling of Groundwater Flow," University of Wisconsin, Madison, WI, January 6-10, 1986.