

Andy VanLoocke

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Education

Ph.D. University of Illinois at Urbana-Champaign, Atmospheric Science, 2012
M.S. University of Illinois at Urbana-Champaign, Atmospheric Science, 2009
B.S. Ohio State University, Geography: specialization Atmospheric Science, 2007

Professional Experience

2013 to pres. Assistant Professor, Iowa State University Department of Agronomy
2012– 2013 Postdoctoral Research Associate, USDA Agricultural Research Service, Urbana
2008 – 2012 Graduate Research Assistant, Department of Atmospheric Sciences, UIUC
2007 Graduate Teaching Assistant, Department of Atmospheric Sciences, UIUC
2007 Research Assistant Technician, SoyFACE, UIUC
2006 Summer research internship, Illinois State Water Survey

Teaching Experience

Fall 2007 Laboratory Instructor: *Introduction to Meteorology*, ATMS-100. UIUC.

Guest Lectures and Course Contributions

Fall 2013 Scaling Photosynthesis from the Canopy to the Globe: *Photosynthesis*, IB-421. UIUC
Fall 2013 Tour: Field Deployed Instrumentation in a Research Setting: *Meteorological Instrumentation*, ATMS-391. UIUC
Fall 2012 Modeling the Surface Energy Balance: *Environmental Plant Physiology*, IB-542. UIUC
Fall 2012 Regional Biogeochemical Cycles: *Environmental Plant Physiology*, IB-542. UIUC
Fall 2012 Tour: Field Deployed Instrumentation in a Research Setting: *Meteorological Instrumentation*, ATMS-391. UIUC
Fall 2012 The Surface Energy Balance: Processes and Impacts: *Meteorological Instrumentation*, ATMS-391. UIUC

Research Interests

Local to regional scale land-atmosphere interactions:

- vegetation, soil, atmosphere feedbacks and impacts on climate and hydrology
- applications to optimal and sustainable land use
- global change impacts on vegetation and the effects on surface energy budget and precipitation

Canopy scale photosynthetic uptake and water use efficiency in agro-ecosystems.

Agricultural adaptation strategies in the context of global change.

Membership in Professional Societies

American Geophysical Union: American Meteorological Society: American Society of Plant Biologists:
International Society of Photosynthesis Research

Publications

- Kucharik CJ, **VanLoocke A**, Lenters JD, Motew MM. (2013) Miscanthus establishment and overwintering in the Midwest US: Can strategic residue management reduce the risk of lethal soil temperatures? *PLoS ONE*, 8, e68847.
- Bernacchi CJ, Bagley J, Serbin SP, Ruiz-Vera U, **VanLoocke A**. (2013) Modeling C3 photosynthesis from the chloroplast to the ecosystem. *Plant Cell & Environment*. DOI: 10.1111/pce.12118.
- Hussain MZ, **VanLoocke A**, Siebers M, Markelz RJC, Ruiz-Vera U, Leakey ADB, Ort DR, Bernacchi CJ. (2013) Growth of maize at future CO₂ concentrations decreases canopy evapotranspiration and soil water depletion. *Global Change Biology*, 19, 1572-1584.
- VanLoocke A**, Twine TE, Zeri M, Bernacchi CJ. (2012) A regional comparison of water-use-efficiency for miscanthus, switchgrass and maize. *Agricultural and Forest Meteorology*, 164, 82-95.
- VanLoocke A**, Betzelberger AM, Ainsworth EA, Bernacchi CJ. (2012) Rising ozone concentrations decrease soybean evapotranspiration and water use efficiency whilst increasing canopy temperature. *New Phytologist*, 195, 164-171.
- Hickman GC, **VanLoocke A**, Dohleman FG, Bernacchi CJ. (2010) A comparison of canopy water use for maize and two perennial grass species identified as potential bioenergy crops. *Global Change Biology Bioenergy*, 2, 157-168.
- VanLoocke A**, Bernacchi CJ, Twine TE. (2010) The impacts of *Miscanthus x. giganteus* production on the Midwest U.S. hydrologic cycle. *Global Change Biology Bioenergy*, 2, 180-191. (in the top 10% of most cited articles in *Global Change Biology Bioenergy* published since January 2010)
- Reports, Educational Tools, White Papers & Conference Proceedings:*
- Carl J. Bernacchi, Justin E. Bagley, Shawn P. Serbin, Ursula M. Ruiz-Vera, David M. Rosenthal, **Andy VanLoocke** "Modeling Diurnal Photosynthesis" : "Modeling Photosynthetic Responses to Light" : "Modeling Photosynthetic Responses to Carbon Dioxide" : "Modeling Photosynthetic Responses to Temperature" <http://demonstrations.wolfram.com/> " " /
Wolfram Demonstrations Project. Published: March 21, 2013
- Bernacchi CJ, **VanLoocke A**, Nesbitt SW. Impact of land use change due to bioenergy on Midwestern US hydrology. (in press) Joint Research Centre on the European Commission Report, *Bioenergy and Water*.
- Sautter E, **VanLoocke A**, Box J. (2007) Measurements of Central Ohio Shortwave Cloud Radiative Effect: Assessment of Solar Power Potential. American Solar Energy Society Conference Technical Paper.
- In review or in preparation:*
- Bagley J, Bernacchi CJ, Davis SC, Georgescu M, Hussain MZ, Miller J, Nesbitt S, **VanLoocke A**. Linking Climate and Vegetation in Bioenergy Agro-ecosystems. Submitted to *Global Change Biology Bioenergy*.
- VanLoocke A**, Twine TE, Kucharik CJ, Bernacchi CJ. Water quality and quantity in the context of large-scale cellulosic biofuel production in the Mississippi-Atchafalaya river basin. In prep.
- Miller J, **VanLoocke A**, Bernacchi CJ. Field based measurements of albedo for two candidate perennial cellulosic biofuel feedstocks and row crops. In prep.
- Bernacchi CJ, **VanLoocke A**. Ecosystem water use in a changing climate. *Annual Review of Plant Biology*. In prep.

Supervision of Students

* Indicates that I was a graduate mentor with Carl Bernacchi as faculty supervisor.

Undergraduate students

Kaitlin Togliatti - B.S. (Atmospheric Science) 2013 – pres. “The effects of reducing leaf chlorophyll content on the surface energy balance of soybean. Department of Atmospheric Science Senior Capstone Project.

*Thomas Hayes - B.S. (Computer Science) 2010-2012: “Coupling process-based models to improve the simulation of land-atmosphere interactions”. Illinois Scholars Undergraduate Research Program. Currently pursuing an M.S. in Scientific Computing at UIUC.

*Kyle Dawson - B.S. (Atmospheric Science) 2009- 2011: “The effects of land-use-change for perennial biofuel feedstock production on surface radiation budget”. Department of Atmospheric Science Senior Capstone Project. Currently pursuing an M.S. in Atmospheric Science at North Carolina State University.

*Aaron Letterly - B.S. (Atmospheric Science) 2008- 2010: Currently pursuing an M.S. in Atmospheric Science at the University of Wisconsin.

Academic Service

2013 – pres. Plant, Cell and Environment Editorial Review Board Member.
2013 Department of Atmospheric Sciences Graduate Affairs Committee, UIUC.

Journals serving as a reviewer for submitted papers:

Ecological Modelling: Environmental Research Letters: Global Change Biology: Global Change Biology – Bioenergy: Journal of Applied Meteorology and Climate: Journal of Hydrology: Photosynthesis Research: Plant, Cell & Environment: Plant Physiology: PLoS ONE

Community Outreach

Jun. 2013 Field tour of Miscanthus and Switchgrass Trials for Summer Crop Sciences 2011 4-H Academy
Dec. 2012 Convener, Outstanding Student Presentation Award Judge Liaison and Judge: Tradeoffs among Water, Land, and Energy for Sustainable Biofuel Production. American Geophysical Union Fall 2012 Meeting.
Oct. 2012 Exhibit organizer and Volunteer: Institute for Genomic Biology UIUC ‘Genome Day’
Jun. 2012 Field tour of UIUC Energy Farm for Summer Crop Sciences 2012 4-H Academy
Jun. 2012 Co-organizer: Water in Bioenergy Agroecosystems Workshop
2011-2012 Graduate Mentor: Illinois Scholars Undergraduate Research Program
Sep. 2011 Presenter: Tropical Maize/Energy Crop Field Day 2011, Brighton IL
Aug. 2011 Presenter: 2011 Farm Progress Show, Decatur IL
2011-2012 Energy Biosciences Institute Seminar Committee
Jun. 2011 Field tour of Miscanthus and Switchgrass Trials for Summer Crop Sciences 2011 4-H Academy
Jun. 2011 Co-hosted Illinois Biomass Working Group tour of Dudley Smith Bioenergy Research Site
Apr. 2011 Interviewed for ABC 15/20 story on UIUC biofuels research at Dudley Smith Bioenergy Research Site
Apr. 2011 Interviewed for Decatur Herald-Review story on UIUC biofuels research at Dudley Smith Bioenergy Research Site
Mar. 2011 Interviewed for Climate Central story on biofuels and climate, www.climatecentral.org
Mar. 2011 Tour Guide: Community College Agricultural Scholars, Dudley Smith Bioenergy Research Site
Feb. 2011 International Baccalaureate Program grades 11&12 project on bioenergy

Oct. 2010	Conducted an interactive science session on the measurement and importance Green House Gases with 1 st graders at McKinsey Elementary School Ashtabula, OH
Sep. 2010	Tour Guide: Energy Biosciences Institute Energy Farm Open House
Jul. 2010	Co-hosted Taylorville IL, Jr. High ecology field trip, Dudley Smith Bioenergy Research Site
Jun. 2010	Tour Guide: Dudley Smith Bioenergy Research Site Open House for University of Illinois Extension Natural Resources Management Team
May 2010	Interviewed for University of Illinois Extension Christian County Program Highlights
Aug. 2009	Tour Guide: University of Illinois Agronomy Day Energy Farm Tour
2009-present	Organizer USDA-ARS Global Change Photosynthesis Research Unit Social Committee
Aug. 2008	Session Leader: Dept. Atm. Sci. UIUC Graduate Teaching Assistant Orientation
Aug. 2008	Session Leader: University of Illinois Graduate Teaching Assistant Orientation
Feb. 2008	Instructor: Central Illinois Boy Scout Merit Badge Program
2006-2007	Volunteer Mentor: Gladden Community House Columbus, Ohio

Grants Received

<i>PI:</i>	Carl J. Bernacchi
<i>Co-PI:</i>	Andy VanLoocke
<i>Agency:</i>	Illinois Water Resource Center
<i>Dates of Award:</i>	2/1/2012 – 11/1/2012
<i>Title:</i>	The Impacts of Cellulosic Biofuel Feedstock Production on Midwest US Hydrologic Cycle
<i>Award Amount:</i>	\$32 K

Honors, Awards and Special Accomplishments

2012	Procter & Gamble Student Research Award Finalist
2012	Student Scholarship 2012 Illinois Water Conference
2011	Graduate College Conference Travel Grant Amer. Soc. of Plant Bio., Minneapolis, MN.
2009	Graduate College Travel Grant American Geophysical Union Meeting. San Francisco, CA.
2008	Graduate College Travel Grant American Geophysical Union Meeting. San Francisco, CA.
2008	Dept. Atm. Sci. UIUC Travel Grant American Geophysical Union Meeting. San Francisco, CA.
2008	Registration Scholarship Biofuels and Sustainability Conference. Champaign, IL.
2007-2008	Dept. Atm. Sci. UIUC Ogura Award for Teaching Excellence (honorable mention)
Fall 2007	Named to UIUC “List of Teachers Ranked as Excellent” (including “outstanding” rankings)
2007	Ohio State University Student Employee of the Year 1 st Runner-up

Presentations

* Indicates invited presentation

Bagley JE, Cuadra S, Drewery D, **VanLoocke A**, Bernacchi CJ. The Influence of Climate on Sustainable North American Bioenergy Potential. American Geophysical Union Annual Meeting. San Francisco, CA 2013.

***VanLoocke A**, Bernacchi CJ, Twine TE, Kucharik C. Scaling Biogeochemical Processes to Quantify the Impacts Regional Scale Land-Use-Change in the Context of Bioenergy. ASA, CSSA, & SSSA International Annual Meetings, Tampa, FL 2013.

Twine TE, Sun J, **VanLoocke A**, Bernacchi CJ, Kucharik C. Representing belowground processes in land surface models: Applications at the regional scale and remaining challenges. 98th Ecological Society of America Annual Meeting. Minneapolis, MN 2013.

***VanLoocke A**. Regional scale hydrologic implications of land-use and global change for the Midwestern US. Illinois State Water Survey – Center for Atmospheric Science. Urbana, IL 2013.

- ***VanLoocke A.** The impact of land-use and global change on water-related agro-ecosystem services in the Midwest US. University of Illinois –Plant Molecular and Physiological Biology Seminar, Urbana, IL 2013.
- ***VanLoocke A.** The impact of land-use and global change on water-related agro-ecosystem services in the Midwest US. Iowa State University –Department of Agronomy, Ames, IA 2012.
- Bagley JE, **VanLoocke A**, Jaiswal D, Bernacchi CJ, Long SP. Impacts of energy cane expansion on ecosystem services: A Florida case study. American Geophysical Union Annual Meeting. San Francisco, CA 2012.
- Bernacchi CJ, Hussain MZ, **VanLoocke A**, Zeri M. Micrometeorological measurements during the transition of perennial biomass feedstocks to annual row crops show more carbon storage, slightly higher water use, and improved water use efficiency. 3rd Pan American Congress on Plants and Bioenergy. Champaign, IL 2012.
- ***VanLoocke A.** Regional scale water dynamics of temperate rain-fed bioenergy agroecosystems. Water in Bioenergy Agroecosystems Workshop. Chicago, IL 2012.
- VanLoocke A**, Hayes TC, Nesbitt SW, Ainsworth EA, Betzelberger AM, Bernacchi CJ. The direct effects of ozone on vegetation influence climate and feedback on tropospheric ozone concentration. American Meteorological Society First Conference on Atmospheric Biogeosciences. Boston, MA 2012.
- Bernacchi CJ, **VanLoocke A**, Hickman GC, Zeri M, Twine TE. Scaling water use of perennial grasses from the plot to the Midwestern U.S. American Meteorological Society First Conference on Atmospheric Biogeosciences. Boston, MA 2012.
- Hussain MZ, **VanLoocke A**, Leakey ADB, Bernacchi CJ. Future carbon dioxide concentration decreases canopy evapotranspiration and soil water depletion in Maize. American Meteorological Society First Conference on Atmospheric Biogeosciences. Boston, MA 2012.
- ***VanLoocke A.** Cellulosic biofuel feedstock production, stream flow, and nutrient transport in the Mississippi River Basin. Sixth Agro-IBIS Workshop. Ames, IA 2012.
- ***VanLoocke A.** Ecosystem services and hydrologic impacts of cellulosic biofuel feedstock production in the Midwest US. Procter & Gamble Student Research Award. Urbana, IL 2012
- VanLoocke A**, Bernacchi CJ, Ainsworth EA, Betzelberger AM. Towards positive feedbacks between vegetation and tropospheric O₃. American Geophysical Union Annual Meeting. San Francisco, CA 2011.
- Bernacchi CJ, **VanLoocke A**, Hickman GC, Zeri M, Twine TE. Scaling water use of perennial grasses from the plot to the Midwestern U.S. American Geophysical Union Annual Meeting. San Francisco, CA 2011.
- VanLoocke A**, Betzelberger A, Ainsworth EA, Bernacchi CJ. No minimum threshold for ozone-induced changes in soybean canopy fluxes. American Society of Plant Biologists. Annual Meeting. Minneapolis, MN 2011.
- Twine TE, **VanLoocke A**, Bernacchi CJ. Impacts of bioenergy feedstock production on environmental factors in the Central U.S. American Geophysical Union Annual Meeting. San Francisco, CA 2010.
- ***VanLoocke A.** Adapting Agro-IBS to incorporate biofuel feedstocks: The process, applications, and implications. The IBIS modeling workshop. St. Paul, MN 2010.
- ***VanLoocke A**, Bernacchi CJ, Twine TE. The Impacts of *Miscanthus x. giganteus* production on the Midwest US Hydrologic Cycle. Illinois State Water Survey. Urbana, IL 2009.
- VanLoocke A.** Effective Communication Strategies. University of Illinois Graduate Teaching Assistant Orientation. Urbana, IL 2008.

Sautter E, **VanLoocke A**, Box J. Measurements of Central Ohio Shortwave Cloud Radiative Effect: Assessment of Solar Power Potential. American Solar Energy Society Conference. Cleveland, OH 2007.

VanLoocke A, Kristovich DAR. Observed Characteristics of Land-Modified Lake-Effect Boundary Layers. North East Ohio American Meteorology Meeting. Youngstown, OH 2006.

Posters

Togliatti K, **VanLoocke A**, Slattery RA, Bernacchi CJ, Ort DR. Reducing Chlorophyll Content in Soybeans Alters the Surface Energy Balance. American Meteorological Society Annual Meeting. Atlanta GA 2014.

VanLoocke A, Slattery R, Bernacchi CJ, Zhu X, Ort DR. Improving photosynthetic efficiency to address food security in the 21st century: Strategies for a more efficient crop canopy. American Geophysical Union Annual Meeting, San Francisco, CA 2013.

Slattery RA, **VanLoocke A**, Zhu X, Ort DR. Can reducing chlorophyll content improve canopy light distribution and photosynthetic efficiency? The 16th International Congress on Photosynthesis. St. Louis, MO 2013.

VanLoocke A, Hussain MZ, Ort DR, Bernacchi CJ. Increasing atmospheric gas concentrations of CO₂ and O₃ will reduce crop water use. American Society of Plant Biologists Annual Meeting. Providence, RI 2013.

Slattery RA, **VanLoocke A**, Zhu X, Ort DR. Lowering chlorophyll content to increase soybean canopy photosynthesis. American Society of Plant Biologists Annual Meeting. Providence, RI 2013.

VanLoocke A, Bernacchi CJ, Hussain MZ, Ort DR. Increasing CO₂ and O₃ concentrations reduce water use in major Midwestern crops: Implications for climate, hydrology and agronomy. 3rd Annual Postdoctoral Research Symposium Brief Program. Urbana, IL 2013.

Bernacchi CJ, **VanLoocke A**, Twine TE, Zeri M, Hussain MZ. The trade-offs between carbon and water in a growing Midwestern biofuel landscape in the context of yields, net ecosystem exchange, and carbon sequestration. 4th North American Carbon Program All-Investigators Meeting. Albuquerque, NM 2013.

VanLoocke A, Bernacchi CJ, Twine TE, Kucharik CJ. Water quality and quantity in the context of large-scale cellulosic biofuel production in the Mississippi-Atchafalaya River Basin. American Geophysical Union Annual Meeting. San Francisco, CA 2012.

Miller JN, **VanLoocke A**, Bernacchi CJ. Field based measurements of albedo for two candidate perennial cellulosic feedstocks and row crops in Central Illinois. American Geophysical Union Annual Meeting. San Francisco, CA 2012.

VanLoocke A, Bernacchi CJ. Cellulosic biofuel production, stream flow, and nutrient transport in the Mississippi River Basin. Illinois Water Conference 2012. Champaign IL 2012.

Hussain MZ, Bernacchi CJ, Zeri M, **VanLoocke A**, DeLucia EH. Summer drought influence on the carbon storage and water use of perennial and annual biofuel feedstocks. 3rd Pan American Congress on Plants and Bioenergy. Champaign IL 2012.

VanLoocke A, Bernacchi CJ. Cellulosic biofuel production, stream flow, and nutrient transport in the Mississippi River Basin. 3rd Pan American Congress on Plants and Bioenergy. Champaign IL 2012.

Bagley J, **VanLoocke A**, Bernacchi CJ. An extended model of regional biofuel production. 3rd Pan American Congress on Plants and Bioenergy. Champaign IL 2012.

Kucharik CJ, **VanLoocke A.** Is miscanthus a high risk biofuel feedstock prospect for the upper Midwest US? American Geophysical Union Annual Meeting. San Francisco, CA 2011.

Betzlberger AM, **VanLoocke A**, Ainsworth EA, Bernacchi CJ. Ozone decreases soybean productivity and water use efficiency. American Geophysical Union Annual Meeting. San Francisco, CA 2011.

VanLoocke A, Bernacchi CJ. No minimum threshold for ozone-induced changes in soybean canopy fluxes. American Society of Plant Biologists Annual Meeting. Minneapolis, MN 2011.

VanLoocke A, Twine TE, Zeri M, Bernacchi CJ. A regional comparison of water-use efficiency for *Miscanthus x giganteus* and *Panicum virgatum*. Ameriflux Science Meeting & 3rd North American Carbon Program Meeting. New Orleans, LA. 2011.

VanLoocke A, Twine TE, Zeri M, Bernacchi CJ. A regional comparison of water-use efficiency for *Miscanthus x giganteus* and *Panicum virgatum*. American Geophysical Union Annual Meeting. San Francisco, CA. 2010.

VanLoocke A, Bernacchi CJ, Twine TE. The Impacts of *Miscanthus x. giganteus* production on the Midwest US Hydrologic Cycle. American Geophysical Union Annual Meeting. San Francisco, CA. 2009.

VanLoocke A, Bernacchi CJ, Twine TE. Regional Environmental Impacts of Biofuel Feedstock Production—Scaling Biogeochemical Cycles in Space and Time. American Geophysical Union Annual Meeting. San Francisco, CA. 2008.

VanLoocke A., Bernacchi CJ, Twine TE. Regional Environmental Impacts of Biofuel Feedstock Production—Scaling Biogeochemical Cycles in Space and Time. American Society of Plant Biologists, Pan American Conference on Plants and BioEnergy, Mérida, Mexico 2008.