Evan J. Coopersmith, PE

Email: ecooper2@gmail.com   Cell #: (610) 639-2087
Websites: www.soilinsight.com, www.prognosticdatasolutions.com, www.traffichackers.com

Education	**Ph.D., July 2013, University of Illinois**, Urbana-Champaign, IL, in Civil & Environmental Engineering **M.S., May 2008, University of Illinois,** Urbana-Champaign, IL, in Civil & Environment Engineering **B.S.E., June 2006, Princeton University,** in Operations Research and Financial Engineering, *Cum Laude* **Honor Societies**: Tau Beta Pi and Sigma Xi
Research Experience	**NASA/USDA, Hydrology & Remote Sensing Laboratory – Research Data Scientist**, Washington D.C. *Achieved out-of-sample accuracy of soil moisture estimation below NASA's target of $0.04m^3/m^3$. Leveraged in-ground sensor estimates and satellite datasets. Developed predictive algorithms for soil moisture at over 100 locations nationwide. Applied geospatial approaches to produce multi-scale soil moisture estimates at USDA and Climate Reference Network test sites. Collaborated with NOAA to assess sensor reliability and CDC to predict incidence of diseases driven by soil-borne pathogens.* Aug. 2013 – Present
	John Deere Technological Innovation Center – Research Data Scientist, Champaign, IL *Produced predictions of field readiness with over 90% accuracy. Worked in concert with agronomic researchers through their local offices during doctoral work. Wrote a white-paper detailing strategic intersections between academic and corporate objectives with respect to usage of 'big data.'* May 2012 – July 2013
Publications In-Progress	**Forecasting Coccidioidomycosis (Valley Fever) Incidence via Soil Moisture Conditions –** *Coopersmith Bell, Benedict, Shriber, McCotter, and Cosh.* Under internal review at the Centers for Disease Control. **Estimating Point-Estimates of Gravimetric Soil Moisture with Machine Learning, Part I: An Analysis During SMEX04 and SMAPVEX15 –** *Coopersmith, Cosh, and Jacobs.* **Estimating Point Estimates of Gravimetric Soil Moisture with Machine Learning, Part II: How "close" must** *in-situ* **Sensors be? An Analysis during SMEX04 and SMAPVEX15 –** *Coopersmith, Cosh, and Jacobs.*
Submitted Publications	**Understanding Temporal Stability: A Long-Term Analysis of ARS Watersheds in the 21st Century –** *Coopersmith, Cosh, and Jacobs.*
Peer-Reviewed Publications	**"Lifting"** *In Situ* **Soil Moisture Measurements with Machine Learning: A Multi-Depth Analysis of USCRN profiles and an Application for AMSR-E Satellite Validation with ECONet Sensors –** *Coopersmith, Cosh, Bell, and, Boyles.* Advances in Water Resources. October, 2016. 10.1016/j.advwatres.2016.10.007 **Deploying Temporary Networks for Upscaling of Sparse Network Stations –** *Coopersmith, Cosh, Bell, Kelly, Hall, Palecki, and Temimi.* Int'l Journal of Applied Earth Obs. and Geoinformation. July, 2016. doi: 10.1016/j.jag.2016.07.013. **Comparison of** *In Situ* **Soil Moisture Measurements: An Examination of the Neutron and Dielectric Measurements within the Illinois Climate Network –** *Coopersmith, Cosh, and Jacobs.* Journal of Atmospheric and Oceanic Tech. June, 2016. doi: 10.1175/JTECH-D-16-0029.1. **Multi-Profile Analysis of Soil Moisture within the U.S Climate Reference Network –** *Coopersmith, Cosh, Bell, and Crow.* Vadose Zone Journal, Oct. 2015. doi: 10.2136/vzj2015.01.0016. **Comparing AMSR-E Soil Moisture Estimates to the Extended Record of the U.S. Climate Reference Network (USCRN) –** *Coopersmith, Cosh, Bindlish, and Bell.* Advances in Water Res., Sept. 2015. doi: 10.1016/j.advwatres.2015.09.003.

Evaluation of the 2012 Drought with a Newly Established National Soil Monitoring Network – *Bell, Leeper, Palecki, Coopersmith, Wilson, Bilotta, and Embler*. Vadose Zone Journal, Aug. 2015. doi:10.2136/vzj2015.02.0023

Soil Moisture Model Calibration and Validation: An ARS Watershed on the South Fork of the Iowa River – Coopersmith, *Cosh, Petersen, Prueger, and Niemeier*. Journal of Hydrometeorology, March, 2015. doi: http://dx.doi.org/10.1175/JHM-D-14-0145.1

Extending the Soil Moisture Data Record of the U.S. Climate Reference Network (USCRN) and Soil Climate Analysis Network (SCAN) – Coopersmith, *Cosh, and Bell.* Advances in Water Resources. February, 2015. doi: 10.1016/j.advwatres.2015.02.006

Field-Scale Moisture Estimates Using COSMOS Sensors: A Validation Study With Temporary Networks and Leaf-Area-Indices – Coopersmith, *Cosh, and Daughtry*. Journal of Hydrology. August, 2014. doi: 10.1016/j.jhydrol.2014.07.060

Using Similarity of Soil Texture and Hydroclimate to Enhance Soil Moisture Prediction – Coopersmith, *Minsker, and Sivapalan*. Hydrology & Earth System Sciences. August, 2014. doi:10.5194/hess-18-3095-2014

Machine Learning Assessments of Soil Drying – Coopersmith, *Minsker, Wenzel, and Gilmore.* Computers and Electronics in Agriculture. June, 2014. doi:10.1016/j.compag.2014.04.004

Patterns of Regional Climate Change: An Analysis of Changing Hydrologic Regimes *Coopersmith, Minsker, and Sivapalan.* Water Resources Research. March, 2014. doi: 10.1002/2012WR013320 (**Featured Paper**)

Exploring the Physical Controls of Regional Patterns of Flow Duration Curves: Part 1– Insights from Statistical Analyses – *Cheng, Yaeger, Viglione, Coopersmith, Ye, and Sivapalan*. Hydrology & Earth System Sciences. November, 2012, doi:10.5194/hess-16-4435-2012

Exploring the Physical Controls of Regional Patterns of Flow Duration Curves: Part 2 – Role of Seasonality and Associated Process Controls – *Ye, Yaeger, Coopersmith, Cheng, and Sivapalan*. Hydrology & Earth System Sciences. November, 2012, doi:10.5194/hess-16-4447-2012

Exploring the Physical Controls of Regional Patterns of Flow Duration Curves: Part 3 – A Catchment Classification System Based on Seasonality and Runoff Regime – Coopersmith, *Yaeger, Ye, Cheng, and Sivapalan.* Hydrology & Earth System Sciences. November, 2012, doi:10.5194/hess-16-4467-2012

Exploring the Physical Controls of Regional Patterns of Flow Duration Curves: Part 4 - A Synthesis of Empirical Analysis, Process Modeling, and Catchment Classification – *Yaeger, Coopersmith, Ye, Cheng, and Sivapalan.* Hydrology & Earth System Sciences. November, 2012, doi:10.5194/hess-16-4483-2012.

Understanding and Forecasting Hypoxia Using Machine Learning Algorithms – Coopersmith, *Minsker, and Montagna*, Journal of Hydroinformatics. 2011. doi:10.2166/hydro.2010.015

Awards   **Englebrecht Fellowship – Department of Environmental Engineering**
Most outstanding graduate student in environmental engineering.

Spring 2013

CEE Alumni Graduate Fellowship for Teaching Excellence
Awarded for promise in teaching. Awarded funding to design and teach a 500-level graduate course in advanced data science topics for civil and environmental engineers.

Spring 2013

University Fellowship – University of Illinois
Awarded for promise in research.

Fall 2006 and Spring 2007

Teaching	**CEE 535 – Env. Systems II: Env. & Water Resources Systems Analysis Under Uncertainty**

Served as primary instructor for CEE 535, Environmental Systems II. Wrote original syllabus, designed ~20 lectures, developed all assignments and grading rubrics. Rated 4.5/5.0 (spring '13) from student evaluations.   Spring 2013

CEE 201 – Systems Eng. and Econ., Teaching Assistant (TA), U. of Illinois
Taught fifteen lectures to 130+ students in a required course. Taught two review sessions per week for 20+ students each. Rated 4.7/5.0 (fall '11), 4.8/5.0 (spring '12), and 4.6/5.0 (fall '12) from student evaluations.   Fall 2011, Spring 2012, and Fall 2012

Certificate in Graduate Teaching – Center for Teaching Excellence, U. of Illinois
Completed two-semester program with CTE, received mid-semester evaluation feedback from students on two occasions (see final ratings above), attended pedagogical seminars, and underwent video-analysis of personal teaching habits.   Spring 2012

Teacher Scholar Certification – Center for Teaching Exc., U. of Illinois   Spring 2013
Teaching w/ Technology – Center for Teaching Excellence, U. of Illinois   Spring 2013
Constructed original educational materials reviewed by students and faculty. Read and reviewed pedagogical literature, observed experienced instructors, and attended seminars for use of technology in the classroom.

"List of Teachers Ranked as Excellent By Their Students"
Awarded for four consecutive semesters, three as a teaching assistant for CEE 201, and a fourth as the primary instructor of CEE 535.   Fall 2011, Spring 2012, Fall 2012, and Spring 2013

Invited Talks	**Multi-Scale Soil Moisture Model Calibration and Validation**, The 2014 workshop at MOISST: Advancing Soil Moisture Science and Applications, Stillwater, OK. June 2014

Extending the Soil Moisture Record of the Climate Reference Network with Machine Learning. American Meteorological Society, Symposium on Meteorological Observation and Instrumentation. Westminster, CO. June 2014.

Data-Driven Soil Moisture Modeling: Multi-Scale Analysis for Decision Support, NASA's SMAP Early-Adopters Teleconference, May 2013.

Data Science Experience	**SoilInsight – Founder and Lead Data Scientist,** Chicago, IL

Developed technology to deliver accurate, high resolution soil moisture estimates for agricultural decision-support and other uses.
                                                                                                                          Jun. 2016 – Present
Prognostic Data Solutions LLC - Founder, Washington D.C. & Chicago, IL
Freelance data scientist and consultant, developing proprietary algorithms for predictive modeling.

TrafficHackers – *Developed predictive models for three major Boston highways using public traffic data. Collaborated with the Massachusetts Department of Transportation and helped to ensure optimal usage of existing datasets. Received mention in the Boston Globe.*
                                                                                                                          Jan. 2014 – Present

Private Consulting - *Developed proprietary statistical tools to assess probability of large-scale snow events in major American cities using NOAA historical climatic data.*
                                                                                                                          March 2015 – June 2015

Private Consulting - *Derived proprietary financial metrics for calculations of inter-year margin analysis for price, cost, and volume changes.*
                                                                                                                          October 2016

BCW Group LLC – Principal and Co-Founder, New York, NY

One of three founding members of a quantitative hedge fund start-up at NYMEX. Achieved 7% returns during a period in which the equity markets fell 35%. Developed proprietary trading algorithms, implemented from 9/2/08 to 4/28/09. Employed machine learning models to build superior risk/reward ratios.

<div align="right">Jan. 2008 – Apr. 2009</div>

Freelance Sabermetric Modeler, Princeton, NJ and Champaign, IL

Asymmetric Objectives & Inefficient Markets: A Non-Parametric Predictor for Major League Baseball Games And the Evaluation of Betting Lines – Mudd Library, Princeton University, Senior Thesis 2006.

Produced 130% annual returns. Developed a proprietary non-parametric predictor for assessing the probabilities of various outcomes using a database of over 50,000 historical baseball games. Placed over 4,000 wagers on baseball games over the course of two seasons.

<div align="right">Spr. 2006 – Fall 2007</div>