

# Matthew J. Skiles

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## CONTACT INFORMATION

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## EDUCATION

**University of Texas-Austin**, Austin, Texas  
M.S./PhD Civil and Environmental Engineering

**In Progress**

**University of Wisconsin-Madison**, Madison, Wisconsin  
B.S. Civil and Environmental Engineering  
• Overall GPA: 3.45/4.00

**May 2017**

**Technical University of Denmark**, Copenhagen, Denmark  
Exchange Semester

**Spring 2015**

## RESEARCH EXPERIENCE

**Biological, Biomimetic, and Synthetic Membranes Research Unit UT-Austin**  
**Professor Manish Kumar's** Research Group

**Sep 2019 - present**

- Next Generation Scalable Biomimetic Membranes for Water and Wastewater Treatment
  - Incorporate synthetic cyclic molecules inspired by biological water channel proteins within interfacially polymerized reverse osmosis (RO) and nanofiltration (NF) membranes.
  - Develop synthetic organic macrocycle molecules to act as artificial water channels (AWCs)
  - Characterize synthetic membrane fouling trends, permeability, and selectivity to relevant contaminants.

**Environmental Chemistry and Technology Research Unit UW-Madison**  
**Professor Jamie Schauer's** Research Group

**Feb 2016 - Jun 2017**

- California Air Resources Board (CARB) PM<sub>2.5</sub> Source Apportionment Study
  - Calculated sampling biases and uncertainties for molecular emission marker measurements from ambient air samples.
  - Applied EPA chemical mass balance (CMB) model to apportion PM mass to major sources using measured chemical tracer mass and source emission profiles.
  - Calculated and compared CMB model uncertainties using numerous uncertainty propagation methodologies and input resolutions.
  - Analyzed potential contribution to PM seasonality caused by tracer reactivity and wind transport patterns, identified with a residence time analysis and grouped with a K-means clustering algorithm.
- Built flow-based systems to resuspend PM deposition samples and load filters for chemical analysis.

**Agricultural Bio-waste Research Unit UW-Madison**  
**Professor Rebecca Larson's** Research Group

**Apr 2014 - Jan 2015**

- Discovery Farms Silage Storage Leachate and Runoff Management Study
  - Conducted an agricultural runoff analysis program with the purpose of examining the efficiency of leachate treatment systems at removing contaminants.
  - Analyzed runoff samples for nutrient loading using chemical processes and spectrophotometer tests.

**USDA-ARS Vegetable Crop Research Unit UW-Madison**  
**Professor Philipp Simon's** Research Group

**Sep 2013 - May 2014**

- Took samples of various carrot species to be tested for sugar content, gene locus, etc.
- Cultivated vegetable crops and catalogued seeds for breeding programs.

## WORK EXPERIENCE

**Energy Performance Assessment Engineer**  
Elutions, Greater Milwaukee Area

**Jun 2017 – May 2019**

- Apply Python, Excel, and statistical software to calculate savings for energy optimization measures identified at commercial and gas processing facilities.
- Identify required data for model building as inferred from research, manuals, and client interaction.
- Establish connection between meters and SCADA software. Develop data processing algorithms for live data and historical datasets retrieved from control systems.
- Build IPMVP compliant energy benchmark models to adjust for the impact of meteorological conditions, site operations, and facility projects. Calculate savings from energy efficiency initiatives.

- Publish savings in written reports and defend analytical processes to clients and government auditors.

### Energy Systems Data Analyst Intern

Dec 2016 - Mar 2017

Blumont Engineering Solutions, Madison, WI

- Built VBA macro tool to compare historical energy load data with outputs from model that simulates energy demand using meteorological data and building stock information.
- Used VBA macro tool to graphically depict energy load and emission sensitivities to projected temperature increases through the mid-century warm period.

### Transportation and Air Quality Analyst Intern

Jun 2015 - Feb 2016

Lake Michigan Air Directors Consortium, Chicago, IL

- SMOKE-MOVES QA Tool
  - Built tool to query and compile the annual SQL input database for the EPA SMOKE-MOVES onroad vehicle emission model in R data frames.
  - Identified relevant trends through data mining and collaboration with colleagues.
  - Developed tool to produce and store tens of thousands of graphics displaying vehicle-specific, temporal, transportation trends and data quality issues.

TECHNICAL SKILLS & CERTIFICATIONS **Programming:** Proficient (Python, R), Familiar (VBA Macros, Matlab)  
**Applications:** Excel, MySQL, Microsoft Office, EPA CMB, MOVES, SMOKE  
**Engineer in Training (EIT)**

ACTIVITIES Engineers Without Borders - **Fundraising Chair** **2014 - 2015**  
 Ecuador Water System Project  
 American Society of Civil Engineers **2015 - 2016**

AWARDS UT-Austin College Recruitment Fellowship  
 UT-Austin Engineering Fellowship  
 UW-Madison Dean's List **Spring 2017**  
 UW-Madison Dean's List **Fall 2016**  
 UW-Madison Dean's List **Fall 2015**

PEER REVIEWED PUBLICATIONS **Matthew Skiles**, Alexandra Lai, Michael R. Olson, James Schauer, and Benjamin de Foy. Source Apportionment of PM2.5 organic carbon in the San Joaquin Valley using monthly and daily observations and meteorological clustering. *Environmental Pollution* **237** 2018 [[Link](#)]

Min-Suk Bae, **Matthew Skiles**, Alexandra Lai, Michael R. Olson, Benjamin de Foy, and James Schauer. Assessment of Forest Fire Impacts on Carbonaceous Aerosols Using Complementary Molecular Marker Receptor Models at two Urban Locations in California's San Joaquin Valley. *Environmental Pollution* **246** 2019 [[Link](#)]

CONFERENCE PROCEEDINGS Benjamin de Foy, Michael R. Olson, Alexandra Lai, Min-Suk Bae, Qingyang Liu, **Matthew Skiles**, and James Schauer. Source Apportionment, Wind Transport and Atmospheric Transformation of Carbonaceous Aerosol in the San Joaquin Valley, California. *International Aerosol Conference* 2018 [[Link](#)]

Michael R. Olson, Alexandra Lai, Min-Suk Bae, Qingyang Liu, **Matthew Skiles**, Benjamin de Foy, and James Schauer. Source Apportionment of Carbonaceous Aerosol in the San Joaquin Valley, California – Sensitivity to Seasonal Variation (Poster). *American Association for Aerosol Research Conference* 2017 [[Link](#)]