

Assaad Mrad
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Education

Nicholas School of the Environment, Duke University – Durham, NC

2016- PhD student, Environment
 Advisor: Gabriel G. Katul

Faculty of Engineering and Architecture, American University of Beirut –
Beirut, Lebanon

2012-2016 Bachelor of Engineering, Mechanical Engineering
 GPA: 3.98/4

Research Interests

I am interested in two branches in the field of biosphere-atmosphere interactions. First, through mathematical and modeling tools, I seek to improve understanding of the traits, functions, and trade-offs related to plant hydraulics. I'm also currently working on how plant water use controls photosynthesis using optimal control theory. Second, I aim to study the deposition of Ultra-Fine Particles (UFPs) on vegetation by improving the turbulent mass and momentum transfer equations used to predict UFP collection. Furthermore, I want to explore how aerosols block stomatal gas exchange and absorb or scatter photosynthetically active radiation that could be used by leaves.

Peer-Reviewed Publications

1. **Mrad A**, Domec J-C, Huang C-W, Katul, GG. Dec 2017. "A Revised Similarity Law in Botanic Describes the Genesis of the Vulnerability Curve Shape in Vascular Plants." American Geophysical Union Fall Meeting.

Conference Presentation and Seminars

1. **Mrad, A.**, Domec, J. C., Huang, C. W., Lens, F., & Katul, G. (2018). A network model links wood anatomy to xylem tissue hydraulic behavior and vulnerability to cavitation. *Plant, cell & environment*.

Honors, Scholarships, and Travel Grants

2012-2016 Faculty of Engineering and Architecture Dean's Honor List

Service

2018-present Fellow, *Building Outdoor Leadership at Duke*

2017-present Graduate Afternoon Seminar coordinator, *Duke Nicholas PhD Advocacy Council*

2014-2016 Committee member, *American University of Beirut Astronomy Club*

2012-2014 Managing volunteer, *Lebanese Red Cross Emergency Medical Services*

2012-2014 Managing volunteer, *Lebanese Red Cross Blood Donation Services*

Languages

English: Professional written and oral proficiency

French: Professional written and oral proficiency

Arabic: Professional written and oral proficiency

Computer Skills

Proficient with Matlab and Mathematica

Extended previous experience with C++ and Java

Basic knowledge of Python