Ayman Suleiman, Professor of Environmental Soil Physics

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# EDUCATION

1995-1999 Michigan State University, East Lansing, Michigan, USA., Ph.D. in “Crop and Soil Sciences.”

* 1. University of Jordan, Amman, Jordan, M.Sc. in “Soils and Irrigation.”
1. University of Jordan, Amman, Jordan, B.Sc. in “Soils and Irrigation.”

**Main Areas of expertise**

* Agricultural water modeling and management.
* Crop simulation modeling.
* Climate change impact on crop water requirements and production.
* Environmental modeling.
* Land-atmosphere interactions.
* Simulating evapotranspiration using remotely-sensed and ground-based data.
* Soil water dynamics modeling.

**PROFESSIONAL EXPERIENCE**

* Professor: December 2013, Dept. of Land, Water and Environment, Faculty of Agriculture, University of Jordan, Amman, Jordan.
* Visiting Professor: September 2012-August 2013, Dept. of Agricultural and Biological Engineering, Indian River Research and Education Center, University of Florida, Fort Pierce, Florida, USA.
* Department Head, September 2010-August 2012, Dept. of Land, Water and Environment, Faculty of Agriculture, University of Jordan, Amman, Jordan.
* Associate Professor: September 2008-current, Dept. of Land, Water and Environment, Faculty of Agriculture, University of Jordan, Amman, Jordan.
* Visiting Scientist: June 2010-August 2010, Dept. of Land, Air, Water Resources, University of California, Davis, California, USA.
* Visiting Scientist: July 2008-June 2009, University of California Desert Research & Extension Center, University of California, California, USA.
* Assistant Professor: September 2005-August 2008, Dept. of Land, Water and Environment, Faculty of Agriculture, University of Jordan, Amman, Jordan.
* Visiting Scientist: April 2005-August 2005, June 2006-August 2006, June 2007-August 2007, Dept. of Agricultural and Biological Engineering, University of Georgia, Georgia, USA.
* Research Assistant professor, July 2002-February 2005, Center for Atmospheric Sciences, Hampton University, Virginia, USA.
* Postdoctoral Research Associate: July 2000-June 2002, Dept. of Civil and Environmental Engineering, Bucknell University, Pennsylvania, USA.
* Postdoctoral Research Associate: January 2000-June 2000, Department of Crop and Soil Sciences, Michigan State University, Michigan, USA.

# Courses Taught

* Environmental Soil Physics, University of Jordan, Jordan (Undergraduate and graduate levels)
* Introduction to Geosciences, Hampton University, USA. (Undergraduate)
* Irrigation Principles and Practices, University of Jordan, Jordan. (Undergraduate)
* Modeling Soil-Plant-Atmosphere Continuum, Hampton University, USA. (Undergraduate)
* Soil-Water- Plant Relations, University of Jordan, Jordan. (Undergraduate)

**Themes of Research Projects**

* Application of crop simulation models in particular the Decision Support System for Agrotechnology Transfer (DSSAT).
* Climate change impact on crop water requirements and water productivity.
* Modeling of the different water balance components.
* Modeling actual evapotranspiration (crop water requirements) from remote sensing data and ground based data.
* Land-atmosphere interactions.
* Soil hydrology.

**SOme Recent Research Projects**

* Promoting conversation agriculture in the Arab World, a joint project between Germany, Lebanon, Syria and Jordan, Supported by The German Academic Exchange Service (DAAD).
* Assessment and monitoring of desertification in Jordan using remote sensing and bioindicators, a joint project between Jordan and CANADA, Supported by North Atlantic Treaty Organization (NATO)- Science for Peace and Security Programme.
* Improved water management for sustainable mountain agriculture: a joint project between The International Center for Agricultural Research in Dry Areas (ICARDA), Jordan, Lebanon and Morocco, Supported by The International Fund for Agricultural Development (IFAD).
* Assessment of the risks from climate change and water scarcity on food productivity, Supported by Food and Agriculture Organization (FAO).
* Modeling of crop evapotranspiration in Jordan Valley from remote sensing data, Supported by The Deanship of Research at the University of Jordan.
* Deficit Irrigation for Mediterranean Agricultural Systems (DIMAS), Supported by European Commission (EC) 6th Framework Programme for Research and Technological Development.

**AWARDS and ACHIEVMENTS**

* Distinguished Researcher Award, 2009/2010, 2011/2012, University of Jordan, Amman, Jordan.
* Distinguished Scholar Award, Fellowships Program, July 2008-June 2009, Arab Fund for Economic and Social Development. Kuwait, State of Kuwait.
* Exceptional Paper Award, the 3rd International Conference on Water Resources and Arid Environments (2008) and the 1st Arab Water Forum, Riyadh, Saudi Arabia 16-19 November 2008.
* Marquis Who’s Who in the World, 2005, Dr. Suleiman biographical profile is included in the 22nd (2005) Edition of Marquis Who’s Who in the World.
* Research Assistantship, May 1995-August 1999, Crop and Soil Sciences Department, Michigan State University, Michigan, USA.
* Research Assistantship, August 1992-August 1994, supported by The International Center for Agricultural Research in Dry Areas (ICARDA), University of Jordan, Jordan
* Royal fund for undergraduate students, August 1988- June 1992, University of Jordan, Jordan

**MEMBERSHIPS**

* Jordan Society for Scientific Research (JSSR)
* Jordan Agricultural Engineers Association
* The International Consortium for Agricultural Systems Applications (ICASA)

**EDITORIAL EXPERIENCE**

* Associate Editor, the Journal of “World Journal of Agricultural Sciences.”
* Editorial Board, the Journal of “Sustainable Watershed Science and Management.”
* Editorial Board, the journal of “Advances in Agriculture.”
* Science Editor, ACCDON LLC (Technology consulting firm, accelerating the publication and commercial realization of client's inventions, innovations, and discoveries).

## Publications

***Journal articles***

1. **Suleiman, A.A.**, C. M. Tojo Sole,and G. Hoogenboom. March 2013. Determining FAO-56 Crop Coefficients for Peanut under Different Water Stress Levels*. Irrigation Science* 31(2):169-178.
2. Tojo Soler, C.M., **A. A. Suleiman,** J. Anothai, I. Flitcroft, and G. Hoogenboom. September 2013. Scheduling Irrigation with a Dynamic Crop Growth Model and Determining the Relation between Simulated Drought Stress and Yield for Peanut. *Irrigation Science* 31(5):889-901.
3. Al-Bakri, J.T. , M. Salahat, **A. Suleiman**, M. Suifan, M. R. Hamdan, S. Khresat, T. Kandakji . 2013. Impact of Climate and Land Use Changes on Water and Food Security in Jordan: Implications for Transcending 'The Tragedy of the Commons. *Sustainability* (Accepted).
4. Al-Qerem, R., **A. A. Suleiman**, and Shatanawi M. 2012. Assessing Tomato Yield and Water Saving Under Water Deficit in Jordan Valley. *Jordan Journal of Agricultural Sciences* 8(2): 209-222.
5. Shatanawi, M., **A. A. Suleiman**, and J. Al-Bakri. 2011. Effect of Deficit Irrigation on Lemon Water Requirements and Yield in Jordan Valley. *Jordan Journal of Agricultural Sciences* 7(3):564-774.
6. Al-Bakri, J.T., **A. A. Suleiman**, F. Abdulla, and J. Ayad. 2011. Potential impacts of climate change on the rainfed agriculture of a semi-arid basin in Jordan. *Physics and Chemistry of Earth* 36(5-6): 125-134.
7. **Ritchie, J. T., Porter, C.H., Judge, J., Jones, J.W., and Suleiman, A. A. 2009.** Extension of an existing model for soil water evaporation and redistribution under high water content conditions. *Soil Science Society of America Journal* 73:792-801.
8. **Suleiman, A.A**., and G. Hoogenboom. 2009. A comparison of ASCE and FAO-56 reference evapotranspiration for a 15-min time step in humid climate conditions. *Journal of Hydrology*, [375(3-4](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%235811%232009%23996249996%231484096%23FLA%23&_cdi=5811&_pubType=J&view=c&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=a06b6e9cec3dc09c3aab8aebba06ea46)): 326-333.
9. **Suleiman, A.,** Al-Bakri, J.T., Duqqah, M. and Crago, R. 2008. Intercomparison of evapotranspiration estimates at the different ecological zones in Jordan. *Journal of Hydrometeorology* 9(5): 903–919.
10. **Suleiman, A.A**. 2008. Modeling daily soil water dynamics during vertical drainage using the incoming flow concept. *Catena* 73(3): 312-320.
11. Rezzoug, W., B. Gabrielle, **A. A. Suleiman**, and K. Benabdeli. 2008. Application and evaluation of the DSSAT-Wheat in the Tiaret region of Algeria. *African Journal of Agricultural Research* 3(4): 284-296.
12. **Suleiman, A.A**., C. M. Tojo Soler,and G. Hoogenboom. 2007. Evaluation of FAO-56 crop coefficient procedures for deficit irrigation management of cotton in a humid climate. *Journal of Agricultural Water Management* 91: 33-42.
13. **Suleiman, A.A**., and G. Hoogenboom. 2007. Comparison of Priestley-Taylor and FAO-56 Penman-Monteith for daily reference evapotranspiration estimation in Georgia, USA. *Journal of Irrigation and Drainage Engineering* 133(2): 175-182.
14. **Suleiman, A.A.,** and J.T. Ritchie. 2005. A simple model to estimate daily lateral drainage. *Soil Science* 170(8): 1-15.
15. Crago, R., and **A.A. Suleiman**. 2005. Heat flux parameterization for sparse and dense grasslands with the Analytical Land-Atmosphere Radiometer Model (ALARM). *Boundary Layer Meteorology* 114(3): 557-572.
16. **Suleiman, A.A.**, and J.T. Ritchie. 2004. Modifications to the DSSAT vertical drainage model for more accurate soil water dynamics estimation. *Soil Science* 169(11): 745-757.
17. Al-Bakri, J., and **A.A. Suleiman**. 2004. NDVI response to rainfall in the different ecological zones in Jordan. International Journal of Remote Sensing 25(19): 3897–3912.
18. **Suleiman, A.A**., and R. Crago. 2004. Hourly and daytime evapotranspiration using radiometric surface temperatures. *Agronomy Journal* 96: 384-390.
19. **Suleiman, A.A.**, and J.T. Ritchie. 2003. Modeling soil water redistribution under second stage evaporation. *Soil Science Society of American Journal* 67(2): 377-386.
20. **Suleiman, A.A**., and R. Crago. 2002. Analytical Land Atmosphere Radiometer Model applied to a dense canopy. *Agricultural and Forest Meteorology* 112:151-159.
21. Zibognon, M., R. Crago, and **A.A. Suleiman**. 2002. Conversion of radiometric to aerodynamic surface temperature with an anisothermal canopy model. *Water Resources Research* 38(6): art. no. 1067.
22. **Suleiman, A.A.**, and R. Crago. 2002. Analytical Land Atmosphere Radiometer Model. *Journal of Applied Meteorology* 41(2): 177-187.
23. **Suleiman, A.A.**, and J.T. Ritchie. 2001. Estimating saturated hydraulic conductivity from soil porosity. *Transactions of American Society of Agriculture Engineers (ASAE)* 44(2): 235-239.
24. Ritchie, J.T., A. Gerakis, and **A.A. Suleiman**. 1999. Simple model to estimate field-measured soil water limits*. Transactions of American Society of Agriculture Engineers (ASAE)* 42(6): 1609-1614.
25. Battikhi, A.M., and **A.A. Suleiman**. 1999. Temporal variation of infiltration rate in Vertisols under lentil-wheat rotation. *J. Agronomy and Crop Sciences* 183(1): 67-70.
26. Battikhi, A.M., and **A.A. Suleiman**. 1999. Effect of tillage system on soil strength and bulk density. *J. Agronomy and Crop Sciences* 183(2):81-90.
27. Battikhi, A.M., and **A.A Suleiman**. 1999. Effect of tillage and plant residue management practices on shrinkage of a Vertisol. *J. Agronomy and Crop Sciences* 182(4): 285-290.
28. Battikhi, A.M., and **A.A. Suleiman**. 1997. Uncertainties of soil moisture readings using neutron probe in Vertisols. *Dirasat, Agricultural Sciences* 24(3): 335-344.

***Some selected proceedings articles***

1. Brown, L., Al-Bakri, J.T., Nickling, W., Kandakji, T., Salahat, M., **Suleiman, A**. and Khresat, S. 2012. Integrating ground surveys and GIS for modeling soil erosion by wind in a semiarid to arid basin in Jordan. International Conference on Sediment transport modelling in hydrological watersheds and rivers, Istanbul, Turkey, 14-16 November, 2012.
2. Al-Bakri, J.T., H. Saoub, W. Nickling **A. Suleiman**, M. Salahat, S. Khresat, T. Kandakji. 2012. Remote sensing indices for monitoring land degradation in a semiarid to arid basin in Jordan. Earth Resources and Environmental Remote Sensing/GIS Applications III, Edinburgh, , United Kingdom | September 24, 2012.
3. **Suleiman, A.A**., Bali, K.M., and Kleissl, J.  Comparison of ALARM and SEBAL evapotranspiration for irrigated alfalfa. Proceedings of the 2009 American Society of Agricultural and Biological Engineers Annual International Conference, Reno, Nevada, June 21 - June 24, 2009.
4. **Suleiman, A. A.,** Al-Bakri, J.T., and Duqqah, M. Estimation of Actual Evapotranspiration in Jordan from Satellite Data. Proceedings of the 3rd International Conference on Water Resources and Arid Environments (2008) and the 1st Arab Water Forum, Riyadh, Saudi Arabia 16-19 November 2008.
5. **Suleiman, A. A**., Al-Bakri, and Duqqah M., M., 2007. A Comparison Study of MODIS and ASCE Alfalfa Evapotranspiration in a Semiarid Climate. Proceedings of the American Society of Agricultural and Biological Engineer's Annual International Meeting. June 17-20, 2007, Minnesota, USA.
6. Shatanawi M., J. Al-Bakri and **A. A. Suleiman** 2007. Lemon evapotranspiration and yield under water deficit in Jordan Valley. In: Lamaddalena, N., Bogliotti, C., Todorovic, M. and Scardigno, A. (eds), Water saving in Mediterranean agriculture and future research needs. Proceedings of the international conference, 14-17 Feb. 2007, Valenzano, Italy. Bari: CIHEAM, Italy. WASAMED Project, Vol. I pp. 63-71. Options Méditerranéennes, Séries B: N.56.
7. Garcia, A.Y.G., L.C. Guerra, **A. A. Suleiman**, J.O. Paz, and G. Hoogenboom. 2007. Peanut water use under optimum conditions of growth and development: a simulation approach. Proceedings of the Georgia Water Resources Conference. March 27-29, Georgia, USA.
8. **Suleiman, A.A.**, C.M., Tojo Soler, and G. Hoogenboom. 2007. Determination of the FAO-56 crop coefficients for peanut under deficit irrigation in a humid climate. Proceedings of the American Society of Agricultural and Biological Engineer's Annual International Meeting. June 17-20, 2007, Minnesota, USA.
9. Duqqah, M.M., K. M. Bali and **A. A.** **Suleiman.** 2007. Management strategies for the reuse of wastewater in Jordan. Proceedings of the USCID Fourth International Conference on Irrigation and Drainage, October 3-6, 2007, California, USA.

**Book chapter**

* **Ayman Suleiman** and Jawad Al-Bakri (2011). Estimating Actual Evapotranspiration using ALARM and the Dimensionless Temperature, Evapotranspiration, Leszek Labedzki (Ed.), ISBN: 978-953-307-251-7, InTech, Available from: <http://www.intechopen.com/articles/show/title/estimating-actual-evapotranspiration-using-alarm-and-the-dimensionless-temperature>.

## PRESENTATIONS

1. **Suleiman, A.A**. 2012. The Impact of climate change on crop water requirements in Jordan. The Third Regional Conference on Water Resources Assessment in the Arab Region April 16, 17 and18, 2012, Amman, Jordan.
2. **Suleiman, A.A**., and Al-Bakri.  2011. Using evapotranspiration water stress index for drought monitoring in Jordan. The American Society of Agricultural and Biological Engineers Annual International Conference, USA.
3. **Suleiman, A.A**., Bali, K.M., and Kleissl, J.  2009. Comparison of ALARM and SEBAL evapotranspiration for irrigated alfalfa. The American Society of Agricultural and Biological Engineers Annual International Conference, USA.
4. **Suleiman, A. A.,** Al-Bakri, J.T., and Duqqah, M. 2008. Estimation of Actual Evapotranspiration in Jordan from Satellite Data. The 3rd International Conference on Water Resources and Arid Environments (2008) and the 1st Arab Water Forum, Riyadh, Saudi Arabia 16-19 November 2008.
5. **Suleiman, A. A**., Al-Bakri, and Duqqah M., M., 2007. A Comparison Study of MODIS and ASCE Alfalfa Evapotranspiration in a Semiarid Climate. The American Society of Agricultural and Biological Engineer's Annual International Meeting, USA.
6. **Suleiman, A.A.**, C.M., Tojo Soler, and G. Hoogenboom. 2007. Determination of the FAO-56 crop coefficients for peanut under deficit irrigation in a humid climate. Proceedings of the American Society of Agricultural and Biological Engineer's Annual International Meeting, USA.
7. **Suleiman, A.A**. December 2004. Hourly and daytime evapotranspiration from grassland using radiometric surface temperatures. American Geophysical Union (AGU) fall meeting. USA.
8. **Suleiman, A.A**. November 2004. Modeling daily soil water dynamics using a daily time step. Annual ASA-CSSA-SSSA meeting, USA.
9. **Suleiman, A.A**. October 2004. Soil water dynamics model. Education & Science Forum, College University of New York, New York, USA. (Invited)
10. **Suleiman, A.A.** April 2004. Remotely sensed and modeled vegetation indices. NOAA-CREST Symposium, Hampton University, Virginia, USA.
11. **Suleiman, A.A.** March 2004. Hourly and daytime evapotranspiration from grassland using radiometric surface temperatures. Biological Systems Simulation Conference, University of Florida, Florida, USA.
12. **Suleiman, A.A**. 2003. Modeling Soil Water Dynamics during Drainage and Evaporation Processes. ASA-CSSA-SSSA meeting.
13. **Suleiman, A.A**. November 2003. Analytical Land Atmosphere Radiometer Model (ALARM) Applied to Canopies of Varied Density. International symposium on remote sensing of the environment, Honolulu, HI, USA.
14. **Suleiman, A.A**. October 10, 2003. Invited. Integrating Water Balance with Land Surface Remote Sensing Applications- Soil Moisture Case. College University of New York, New York, USA.
15. **Suleiman, A.A**. 2002. A Simple Numerical Method in Modeling Soil Water Dynamics during Vertical Drainage. American Geophysical Union fall meeting, USA.
16. **Suleiman, A.A**. 2002. Modeling Soil Water Dynamics during Vertical Drainage: A Comparative Study. American Society of Agronomy annual meeting, USA.
17. **Suleiman, A.A**. July 2002. Interdisciplinary Approach for Modeling Land-Surface Interactions. Hampton University, Hampton, VA.
18. **Suleiman, A. A**. 2001. Modeling soil water dynamics during vertical drainage. American Society of Agronomy annual meeting.
19. **Suleiman, A.A**., and R. Crago. Spring 2001. Analytical Land Atmosphere Radiometer Model applied to a Dense Canopy. American Geophysical Union spring meeting.
20. **Suleiman, A.A.,** and R. Crago. Fall 2000. Conversion of Radiometric to Aerodynamic Surface Temperature. American Geophysical Union fall meeting.
21. **Suleiman, A.A**., and J.T. Ritchie. 2000. Modeling soil water redistribution during second stage evaporation. American Society of Agronomy annual meeting.
22. **Suleiman, A.A**., and J.T. Ritchie. 1999. A simple model to estimate daily drainage. American Society of Agronomy annual meeting.
23. **Suleiman, A.A.,** and J.T. Ritchie. 1998. Modeling the spatial variability of soil water distribution and evapotranspiration of a cropped, slopping landscape. American Society of Agronomy annual meeting.