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# Prof. Dr. Fatih Evrendilek's Research Interests

- **PhD in Environmental Science—The Ohio State University (USA)**

- **MA in Environmental & Energy Policy—University of Delaware (USA)**

- **Currently affiliated to the Department of Environmental Engineering of Abant Izzet Baysal University (Turkey)**

# SPATIO-TEMPORAL ANALYSES OF CHANGING GLOBAL ENVIRONMENT

- How do ecosystem structure & function in response to changes in climate & land use/cover?

- How do we measure, monitor, map, model & manage spatio-temporal dynamics of terrestrial & aquatic ecosystem components & biogeochemical cycles ?

# SPATIO-TEMPORAL ECOSYSTEM ANALYSES

- BY INTEGRATING REMOTELY SENSED DATA, FIELD CAMPAIGNS, PROXY CONTINUOUS SENSORS, EDDY COVARIANCE, STATISTICAL MODELS, ARTIFICIAL NEURAL NETWORKS, GEOSTATISTICAL MODELS, PROCESS-BASED MODELS, WAVELET DENOISING, STOCHASTIC SIMULATIONS, AND ECOSYSTEM MONITORING & MAPPING WITH GEOGRAPHIC INFORMATION SYSTEMS (GIS)

# GLOBAL CLIMATE CHANGE

- **Evrendilek, F.,** Wali, M.K. 2001. Modelling long-term C dynamics in croplands in the context of climate change: a case study from Ohio. [Environmental Modelling & Software](#) 16(4): 361-375.

- **Evrendilek F.,** Wali, M.K. 2004. Changing global climate: historical carbon and nitrogen budgets and projected responses of Ohio's Cropland ecosystems. [Ecosystems](#) 7(4): 381-392.

# C & N BUDGETS

- **Evrendilek, F.,** Celik, I., Kilic, S. 2004. Changes in soil organic carbon and other physical soil properties along adjacent Mediterranean forest, grassland and cropland ecosystems in Turkey. Journal of Arid Environments 59(4): 743-752.

- **Evrendilek, F**, Karakaya, N, Aslan RG, Ertekin, C. 2011. Using eddy covariance sensors to quantify carbon metabolism of peatlands: a case study in Turkey. Sensors 11(1): 522-538.

# EDDY COVARIANCE & FLUX TOWER

- **Evrendilek, F.** 2014. Modeling net ecosystem $CO_2$ exchange using temporal neural networks after wavelet denoising. Geographical Analysis 46: 37-52.

- **Evrendilek, F.** 2013. Quantifying biosphere-atmosphere exchange of $CO_2$ using eddy covariance, wavelet denoising, neural networks, and multiple regression models. Agricultural and Forest Meteorology 171-172:1-8.

# PROCESS-BASED MODELING

- Wali, M.K., **Evrendilek, F.,** West, T., Watts, S., Pant, D., Gibbs, H., McClead, B. 1999. Assessing terrestrial ecosystem sustainability: usefulness of regional carbon and nitrogen models. Nature & Resources 35(4): 20-33.

- **Evrendilek, F.,** Wali, M.K. 2001. Modelling long-term C dynamics in croplands in the context of climate change: a case study from Ohio. Environmental Modelling & Software 16(4): 361-375.

# Remote sensing of ecosystem dynamics

- **Evrendilek F**., Gulbeyaz O. 2008. Deriving vegetation dynamics of natural terrestrial ecosystems from MODIS NDVI/EVI data over Turkey. Sensors 8(9): 5270-5302.

- **Evrendilek F**., Gulbeyaz O. 2011. Boosted decision tree classifications of land cover over Turkey integrating MODIS, climate and topographic data. International Journal of Remote Sensing 32(12): 3461-3483.

# ECOSYSTEM MONITORING VIA PROXY SENSORS

- **Evrendilek, F.,** Ben-Asher, J., Aydın, M., Çelik, I. 2005. Spatial and temporal variations in diurnal $CO_2$ fluxes of different Mediterranean ecosystems in Turkey. Journal of Environmental Monitoring 7(1): 151-157.

- **Evrendilek**, **F**., J. Ben-Asher, M. Aydın. 2008. Diurnal photosynthesis, transpiration, water use efficiency and light use efficiency of wheat under Mediterranean field conditions, Turkey. Journal of Environmental Biology 29(3): 397-406.

# Ecosystem monitoring via geographical information systems

- Kılıç, S., **Evrendilek, F.,** Berberoğlu, S., Demirkesen, A.C. 2006. Environmental monitoring of land-use and land-cover changes in a Mediterranean region of Turkey. Environmental Monitoring & Assessment 114: 157-168.

- Demirkesen, A.C., **Evrendilek, F.,** Berberoglu, S. 2008. Quantifying coastal inundation vulnerability of Turkey to sea-level rise. Environmental Monitoring & Assessment 108(1-3): 101-106.

# Wavelet denoising

**Evrendilek, F,** Karakaya, N. 2014. Regression model-based predictions of diel, diurnal and nocturnal dissolved oxygen dynamics after wavelet denoising of noisy time series. Physica A Statistical Mechanics and its Applications 404: 8–15.

**Evrendilek, F**., Karakaya, N. 2015. Spatiotemporal modeling of saturated dissolved oxygen through regressions after wavelet denoising of remotely and proximally sensed data. Earth Science Informatics (in press) DOI 10.1007/s12145-014-0148-4.

# ARTIFICIAL NEURAL NETWORKS

- **Evrendilek F**, Karakaya N. 2014. Monitoring diel dissolved oxygen dynamics through integrating wavelet denoising and temporal neural networks. Environmental Monitoring and Assessment 186(3): 1583-1591.

- **Evrendilek, F.** 2014. Assessing neural networks with wavelet denoising and regression models in predicting diel dynamics of eddy covariance-measured latent and sensible heat fluxes and evapotranspiration. Neural Computing & Applications 24(2): 227-237.

# (Geo)statistical Modeling

- **Evrendilek F**, Berberoglu S, O. Gulbeyaz, Ertekin, C. 2007. Modeling potential distribution and carbon dynamics of natural terrestrial ecosystems: a case study of Turkey. Sensors 7(10): 2273-2296.

- **Evrendilek F**., Ertekin C. 2008. Assessing solar radiation models using multiple variables over Turkey. Climate Dynamics 31(2/3): 131-149.

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- **Evrendilek, F**., Karakaya, N, Gungor, K, Aslan, G. 2012. Satellite-based and mesoscale regression modeling of monthly air and soil temperatures over complex terrain in Turkey. Expert Systems with Applications 39(2): 2059-2066.

- Taskinsu-Meydan S, **Evrendilek F**., Berberoglu S, Donmez C. 2010. Modeling aboveground litterfall in eastern Mediterranean conifer forests using fractional tree cover, and remotely sensed and ground data. Applied Vegetation Science 13: 485-497.

# SUSTAINABLE ECOSYSTEM MANAGEMENT

- **Evrendilek, F.,** Doygun, H. 2000. Assessing major ecosystem types and the challenge of sustainability in Turkey. Environmental Management 26(5): 479-489.

- **Evrendilek, F.** 2003. Identification of ecologically significant habitats for urban nature conservation: a case study in Turkey. Journal of Environmental Biology 24(3): 241-251.

# Ecosystem productivity

- Berberoglu S., **Evrendilek F**., Ozkan C., Donmez, C. 2007. Modeling forest productivity using Envisat MERIS data. Sensors 7: 2115-2127.

- Sermenli, T., **Evrendilek**, **F.,** Mavi, K. 2007. Effects of strip intercropping and organic farming systems on quantity and quality of maize yield in a Mediterranean region of Turkey. Journal of Sustainable Agriculture 30(4): 109-118.

- **Evrendilek, F.** 2004. An inventory-based carbon budget for forest and woodland ecosystems of Turkey. Journal of Environmental Monitoring 6(1): 24-30.

# Energy policies

- **Evrendilek, F.,** Ertekin, C. 2003. Assessing the potentials of renewable energy sources in Turkey. [Renewable Energy](#) 28(15): 2303-2315.

- Ertekin C, Caglayan N, **Evrendilek F**. 2014. Spatial viability analysis of grid-connected photovoltaic power systems for Turkey. International Journal of Electrical Power and Energy Systems 56: 270–278.

# ENVIRONMENTAL POLICIES

- **Evrendilek, F.,** Ertekin, C. 2002. Agricultural sustainability in Turkey: integrating food, environmental and energy securities. [Land Degradation & Development](#) 13(1): 61-67.

- Odemis, B., **Evrendilek**, **F.** 2008. Multivariate analysis of watershed health and sustainability in Turkey. The International Journal of Sustainable Development and World Ecology 15(3): 265–272.

# ECOSYSTEM REHABILITATION/RESTORATION

- Wali M.K., N.M. Safaya, F. **Evrendilek**. 2002. Ecological rehabilitation and restoration in the Americas with special reference to the United States of America. In Handbook of Restoration Ecology, edited by M. R. Perrow and A. J. Davy, Volume 2, pp. 3-31. Cambridge University Press, Cambridge, UK.

- **Evrendilek F**, Berberoglu S, Karakaya N, Cilek A, Aslan G, Gungor K. 2011. Historical spatiotemporal analysis of land-use/land-cover changes and carbon budget in a temperate peatland (Turkey) using remotely sensed data. Applied Geography 31: 1166-1172.

# ENVIRONMENTAL EDUCATION

- Wali M.K., F. **Evrendilek**, M.S., Fennessy. 2009. THE ENVIRONMENT: SCIENCE, ISSUES AND SOLUTIONS. CRC Press/Taylor & Francis Group. Boca Raton,FL. ISBN: 978-0-8493-7387-9, pp. 648.

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