

## Onur Akay, Ph.D.

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### Education

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- 2003 – 2007: Doctor of Philosophy, Civil Engineering, Department of Civil Engineering, University of Mississippi, University, MS, USA  
Dissertation: Laboratory experiments and numerical modeling of the interconnectivity of macropores and subsurface drainage (*advisor: G.A. Fox*)
- 2000 – 2002: Master of Science, Hydraulics Engineering, Department of Civil Engineering, Istanbul Technical University, Istanbul, TURKEY  
Thesis: Hydrodynamic simulation of the Bosphorus Strait (*advisor: S. Kabdaşlı*)
- 1996 – 2000: Bachelor of Science, Civil Engineering, Department of Civil Engineering, Dokuz Eylül University, Izmir, TURKEY  
Graduation project: Flood control of Fetrek Creek and groundwater recharge (*in Turkish*) (*advisor: T. Baran*)

### Professional Experience

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- 05/2019 – present : Associate Professor at Department of Civil Engineering, Istanbul Okan University (IOU), Istanbul, TURKEY
- 08/2014 – 09/2017 : Chairman at Department of Civil Engineering, Istanbul Okan University, Istanbul, TURKEY
- 11/2009 – 05/2019 : Assistant Professor at Department of Civil Engineering, Istanbul Okan University, Istanbul, TURKEY
- 09/2007 – 09/2009: Water Resources Engineer/Hydrologist at Post, Buckley, Schuh & Jernigan, Inc.(PBS&J), Henderson, NV, USA
- 08/2006 – 08/2007: Research Engineer at Department of Biosystems and Agricultural Engineering, Oklahoma State University (OSU), Stillwater, OK, USA
- 11/2004 – 08/2006: Research Assistant at Department of Civil Engineering, University of Mississippi (UM), University, MS, USA
- 08/2003 – 11/2004: Research Assistant at National Center for Computational Hydroscience and Engineering, University of Mississippi, University, MS, USA
- 03/2001 – 08/2003: Research Assistant at Hydraulics Laboratory, Istanbul Technical University (ITU), Istanbul, TURKEY

### Selected Consulting/Design Projects (Flood mapping/Urban drainage/River restoration)

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- Technical report on Kocaeli Dilovasi Dil River stream restoration project for the factory of Olmuksan International Paper Ambalaj San. ve Tic. A.Ş.  
- *Capacity analysis of cross-sections for 1000-year flow*  
- *Calculation of the freeboard*
- Experimental determination of the Manning roughness coefficient for Vesbo® uPVC spira pipe (*in collaboration with Dokuz Eylül University Hydraulics Laboratory*)
- Technical drainage study for the Clark County Water Reclamation District (CCWRD) Advanced Water Treatment Plant Membrane/Ozone Project, Las Vegas, Nevada

- Existing and ultimate condition hydrologic analysis
- Normal depth calculations (*FlowMaster*) for the storm drain laterals and water head calculations for the drop inlets
- Hydraulic grade line (HGL) calculations for the storm drains using *Water Surface Pressure Gradient (WSPG)*
- Clark County Water Reclamation District Las Vegas Wash channelization improvements request for Conditional Letter of Map Revision, Las Vegas, Nevada
  - Floodway analysis for pre and post-project conditions
- Stable slope analysis for Pittman Wash, Las Vegas, Nevada
  - Use of GIS Spatial analysis to determine the long-term aggradation/degradation along the study reaches
  - Use of sediment transport formulations (*Empirical Power Relationship, Copeland Method*) to estimate the historical sediment inflow
  - Use of incipient motion/tractive force formulations (*Skhoklitsch Method, Meyer-Peter Muller Method, Shield's Diagram Method, Lane's Tractive Force Method*)
- Cactus Avenue / UPRR grade separation 60% drainage design, Las Vegas, Nevada
  - Existing condition hydraulic model setup (*HEC-GeoRAS*) to estimate the amount of flow impacting the project site
  - Construction of a 2-D model (*FLO-2D*) to verify the *HEC-RAS* results
- Fourmile Creek and Mudd Gulch H&H Analysis and PMR, Canon City, Colorado
  - Subbasin delineation (*ArcHydro* tools) and hydrologic analysis using *SCS* and *Regression equations*
  - Hydraulic analysis, floodplain delineation (*Zone AE, Zone X*), and floodway analysis
  - Preparation of *TSDN*
- Lower Occoquan Watershed hydraulic analysis and floodplain mapping, Fairfax County, Virginia
  - Preliminary modeling using *RFD (Rapid Floodplain Delineation)* software
  - Use of *HEC-RAS* & *HEC-GeoRAS* for hydraulic modeling and floodplain mapping
- State of Georgia flood map modernization, Marietta, Georgia
  - QC of hydraulic analysis and floodplain mapping for *Toombs, Jenkins and Jeff Davis County*
  - Redelineation of effective *Zone AE* for *Appling, Bacon, Toombs, Jenkins, and Jeff Davis County*

#### Certificates/Training

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- Certificate: Certified Floodplain Manager (CFM) issued by the Association of State Floodplain Managers, Inc. (ASFPM - Certificate No: US-08-03219)
- Workshop: 'General information on the accreditation of engineering programs' by Association for Evaluation and Accreditation of Engineering Programs (MÜDEK), 9 May 2015, Istanbul, TURKEY.
- Training: 'The National Flood Insurance Program - An Overview' by Jennifer Marcy, PBS&J Floodplain Hazard Management Division, 6 February 2008, Beltsville, MD, USA.
- Training: 'HEC-HMS, Hydrologic Modeling System Short Course', PBS&J University, 24–26 October 2007, Henderson, NV, USA.
- Training: 'Scour Analysis for Stream Restoration' by D. Williams, PhD, PBS&J, *EWRI World Environmental & Water Resources Congress*, 14 May 2007, Tampa, FL, USA.
- Training: 'Conceptual and Mathematical Modeling of Flow and Contaminant Transport in the Subsurface' by Dr. Jacob Bear, 11–13 October 2006, Oxford, MS, USA.

- Research & Training: ‘TELEMAC Hydrodynamic Modeling System’ by HR Wallingford, 25–29 March 2002, Wallingford, Oxfordshire, United Kingdom.

#### Research Projects at OSU & UM

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- Experimental analysis and modeling of macropore flow during artificial subsurface drainage. Supported by USDA CSREES- Cooperative State Research, Education, and Extension Service
  - *Design and build laboratory soil columns and setups*
  - *Use of HYDRUS computer model for verification of data and to test macropore connectivity to subsurface drains at different locations in the field*
  - *Selection and operation of equipments such as datalogger, tensiometers, pressure transducers, infiltrometer*
  - *Collection of undisturbed soil samples from field. Lab tests included determining bulk density, particle size analysis, water retention curves (use of Tempe Cells)*
- Quantifying the importance of lateral, subsurface flow on sediment load to streams. Supported by USDA CSREES-Cooperative State Research, Education, and Extension Service
  - *Collection and analysis of field data including stream bank seepage flow and sediment concentrations*
  - *Conduct laboratory lysimeter experiments to investigate subsurface erosion processes under various layering and hydrologic conditions*
- Removal of airborne particulate during spray application of surficially-applied emulsions. Supported by U.S. Army Corps of Engineers, Engineer Research and Development Center
  - *Design and construction of particle disperser and horizontal flow chamber*
  - *Determine adequate spray nozzles/fittings*
  - *Perform control experiments to achieve operation/mass balance requirements*

#### Research Projects at IOU

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- Investigation of the behavior of fiber reinforced sandy slopes under seepage flow by laboratory physical experiments and numerical analyses. Supported by TUBITAK (The Scientific and Technological Research Council of Turkey) 1001 - Scientific and Technological Research Projects Funding Program, Project No: 215M745 (June 2016 – June 2018, *Principal Investigator*)
- Assessment of flood frequency estimation procedures under the environmental changes (SELFREK). Supported by TUBITAK & COST (European Cooperation in Science and Technology) Project No: 110M375 (Sept. 2010 – Sept. 2012, *Researcher*)

#### Peer-reviewed Journal Articles

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- Özer, A.T., Akay, O. Behavior of embankments with geosynthetic basal reinforcement under seepage flow. *Soils and Foundations (under review)*
- Akay, O., Özer, A.T., Fox, G.A., Wilson, G.V., 2018. Application of fibrous streambank protection against groundwater seepage erosion. *Journal of Hydrology* 565, 27–38 (10.1016/j.jhydrol.2018.08.010)
- Akay, O., Özer, A.T., Fox, G.A., Wilson, G.V., 2018. Fiber reinforced sandy slopes under groundwater return flow. *Journal of Irrigation and Drainage Engineering* 144(5) (10.1061/(ASCE)IR.1943-4774.0001300) (*selected as ‘Editor’s Choice’ for May 2018 issue*)
- Akay, O., 2018. Experimental investigation of sandy loam soil erosion on a 45-degree slope under the effect of groundwater flow. *Pamukkale University Journal of Engineering Sciences* 24(6), 967–973 (10.5505/pajes.2017.29863 – *in Turkish*)

- Akay, O., 2016. Slope stabilisation using EPS block geofoam with internal drainage system. *Geosynthetics International* 23(1), 9–22 (10.1680/jgein.15.00028)
- Özer, A.T., Akay, O., 2016. Interface shear strength characteristics of interlocked EPS-Block geofoam. *Journal of Materials in Civil Engineering* 28(4) (10.1061/(ASCE)MT.1943-5533.0001418)
- Akay, O., Özer, A.T., Fox, G.A., 2014. Assessment of EPS block geofoam with internal drainage for sandy slopes subjected to seepage flow. *Geosynthetics International* 21(6), 364–376 (10.1680/gein.14.00024)
- Özer, A.T., Akay, O., Fox, G.A., Bartlett, S.F., Arellano, D., 2014. A new method for remediation of sandy slopes susceptible to seepage flow using EPS-block geofoam. *Geotextiles and Geomembranes* 42(2), 166–180 (10.1016/j.geotexmem.2014.01.003)
- Akay, O., Özer, A.T., Fox, G.A., Bartlett, S.F., Arellano, D., 2013. Behavior of sandy slopes remediated by EPS-block geofoam under seepage flow. *Geotextiles and Geomembranes* 37, 81–98 (10.1016/j.geotexmem.2013.02.005)
- Akay, O., Fox, G.A., Šimůnek, J., 2008. Numerical simulation of flow dynamics during macropore-subsurface drain interactions using HYDRUS. *Vadose Zone Journal* 7(3), 909–918. (10.2136/vzj2007.0148)
- Akay, O., Fox, G.A., 2007. Experimental investigation of direct connectivity between macropores and subsurface drains during infiltration. *Soil Science Society of America Journal* 71(5), 1600–1606 (10.2136/sssaj2006.0359)
- Fox, G.A., Wilson, G.V., Simon, A., Langendoen, E., Akay, O., Fuchs, J.W., 2007. Measuring streambank erosion due to ground water seepage: Correlation to bank pore water pressure, precipitation, and stream stage. *Earth Surface Processes and Landforms* 32(10), 1558–1573 (10.1002/esp.1490)  
(included in a Virtual Issue, “a collection of Water Resources hot papers that have been compiled in an online special issue”)

International Conference Proceedings (*presenter in bold*)

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- **Özer, A.T.**, Akay, O., 2018. Reduced scale laboratory physical model for a geotextile reinforced embankment under groundwater flow. *11<sup>th</sup> International Conference on Geosynthetics*, 16–21 September 2018, Seoul, Korea.
- **Akay, O.**, Özer, A.T., 2018. Use of polypropylene fiber against hillslope erosion induced by groundwater seepage. *5<sup>th</sup> IAHR Europe Congress*, 12–14 June 2018, Trento, Italy.
- **Akay, O.**, Özer, A.T., 2018. Laboratory experiments of hillslope erosion induced by groundwater seepage. *European Geosciences Union General Assembly 2018*, Geophys. Res. Abstr. 20, EGU2018–3071, 8–13 April 2018, Vienna, Austria.
- **Akay, O.**, Özer, A.T., Elbeyli, Y., Pular, M., 2016. Investigating the failure mechanisms of sandy slopes under seepage using reduced scale laboratory models. *4<sup>th</sup> International Conference on New Developments in Soil Mechanics and Geotechnical Engineering*, 2–4 June 2016, Near East University, Nicosia, North Cyprus.
- **Özer, A.T.**, Akay, O., Ateş, Y., 2016. Shear strength properties of interlocked EPS-block geofoam – Ottawa sand interface. *4<sup>th</sup> International Conference on New Developments in Soil Mechanics and Geotechnical Engineering*, 2–4 June 2016, Near East University, Nicosia, North Cyprus.
- **Akay, O.**, Özer, A.T., Fox, G.A., Wilson, G.V., 2016. Behavior of fiber reinforced sandy slopes under seepage. *ASCE World Environmental and Water Resources Congress: Watershed Management, Irrigation and Drainage, and Water Resources Planning and Management*,

Pathak C. S. & Reinhart D., Editors, pp. 397–406, 22–26 May 2016, West Palm Beach, Florida (10.1061/9780784479858.041)

- **Özer, A.T.**, Akay, O., Ateş, E., 2015. Effect of displacement rate on the interface shear strength properties of interlocked EPS-block geofoam. *IRF Europe & Central Asia Regional Congress*, 15–18 September 2015, Istanbul, Turkey.
- **Akay, O.**, Özer, A.T., Fox, G.A., 2014. Use of EPS block geofoam with internal drainage for sandy slopes subjected to seepage flow. *10<sup>th</sup> International Conference on Geosynthetics*, 21–25 September 2014, Berlin, Germany.
- **Özer, A.T.**, Akay, O., 2014. Use of interlocked EPS block geofoam for sandy slopes subjected to seepage flow. *10<sup>th</sup> International Conference on Geosynthetics*, 21–25 September 2014, Berlin, Germany.
- **Akay, O.**, Özer, A.T., Fox, G.A., 2012. Experimental investigation of failure mechanism of expanded polystyrene block geofoam slope system under seepage. *5<sup>th</sup> European Geosynthetics Congress (EuroGeo5), Volume 4 – Soil Improvement and Reinforcement*, pp. 13–17, 16–19 September 2012, Valencia, Spain.
- **Fox, G. A.**, Akay, O., Malone, R., Ma, L., Sabbagh, G., 2007. An improved express fraction for modeling macropore/subsurface drain interconnectivity. *ASABE Annual International Meeting*, 17–20 June 2007, Minneapolis, MN, USA. ASABE Paper No. 072139, ASABE: St. Joseph, MI (10.13031/2013.23235)
- **Akay, O.**, Fox, G.A., 2006. Experimental investigation of direct connectivity between macropores and subsurface drains during infiltration. *ASCE World Environmental and Water Resources Congress: Examining the Confluence of Environmental and Water Concerns*, Graham R., Editor, pp. 1–10, 21-25 May 2006, Omaha, NE, USA. (10.1061/40856(200)301)
- Akay, O., **Fox, G.A.**, 2006. Interconnectivity of macropores and subsurface drains: Influence on Breakthrough Curves. *USDA-CSREES National Water Conference*, 5–9 February 2006, San Antonio, TX, USA.
- **Akay, O.**, Yagci, O., Kabdasli, S., 2003. The hydrodynamics of the Bosphorus Strait: A three-dimensional -TELEMAC-3D- simulation, *EGS-AGU-EUG Joint Assembly*, 6–11 April 2003, Nice, France.

National Conference Proceedings (*presenter in bold*)

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- **Akay, O.**, Özer, A.T., 2019. Yeraltı suyu sızma erozyonunun önlenmesinde sentetik lif katkısının kullanılması. *10. Ulusal Hidroloji Kongresi*, 9–12 Ekim 2019, Muğla Sıtkı Koçman Üniversitesi, Muğla.
- **Akay, O.**, Özer, A.T., 2019. Sızma suyu etkisindeki sentetik lifle güçlendirilmiş kumlu şevlerin incelenmesi. *G8 Sekizinci Ulusal Geosentetikler Konferansı*, 16–17 Mayıs 2019, Boğaziçi Üniversitesi, İstanbul.
- **Özer, A.T.**, Akay, O., Bircan, F., 2019. Geotekstil ile güçlendirilmiş duvarın yeraltı suyu akımı altında laboratuvar modeli ile incelenmesi. *G8 Sekizinci Ulusal Geosentetikler Konferansı*, 16–17 Mayıs 2019, Boğaziçi Üniversitesi, İstanbul.
- **Akay, O.**, Özer, A.T., Levent Yüzer, Y., Bilen, M., Bozkır, Ş., 2017. Sızma erozyonunun laboratuvar ölçeğinde değerlendirilmesinde üç-boyutlu lazer tarama. *9. Ulusal Hidroloji Kongresi*, 4–6 Ekim 2017, Dicle Üniversitesi, Diyarbakır.
- **Özer, A.T.**, Akay, O., Usturbelli, E., 2017. Geleneksel geofoam blok otoyol dolgusundaki ara yüzler ve mukavemetleri. *G7 Yedinci Ulusal Geosentetikler Konferansı*, 11–12 Mayıs 2017, Boğaziçi Üniversitesi, İstanbul.

- Akay, O., **Özer, A.T.**, 2015. Kumlu şevlerin sızma kuvvetleri altındaki davranışlarının iki ve üç boyutlu laboratuvar fiziksel modelleri ile araştırılması. 6. *Geoteknik Sempozyumu*, 26–27 Kasım 2015, Çukurova Üniversitesi, Adana.
- Akay, O., 2010. Akarsu kaynaklı taşkın alanlarının belirlenmesinde HEC-GeoRAS ve CBS kullanımı. II. *Ulusal Taşkın Sempozyumu*, 22–24 Mart 2010, Afyonkarahisar.
- Akay, O., Birinci, V., Bulu, A., 2010. Taşkın alanlarının planlanması ve yönetimi, II. *Ulusal Taşkın Sempozyumu*, 22–24 Mart 2010, Afyonkarahisar.

#### National Newsletter

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- Özer, A.T., Akay, O., 2014. Use of EPS-Block geofoam in slope remediation. *EPS HABER* 15, 38–40.

#### Conference Organization

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- Organizing and scientific committee member of International Conference of Sediment Transport Modeling in Hydrological Watersheds and Rivers, 14–16 November 2012, Istanbul, Turkey ([www.medfriend.itu.edu.tr](http://www.medfriend.itu.edu.tr))
- International coordination committee member of the 5<sup>th</sup> European Geosynthetics Congress, 16–19 September 2012, Valencia, Spain ([www.eurogeo5.org](http://www.eurogeo5.org))
- Organizing committee member of 4<sup>th</sup> National Hydrology Congress, 21–25 June 2004, Istanbul, Turkey

#### Advisor for M.Sc. Thesis

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- Bilen, M., 2018. Laboratory experimental investigation of using fiber inclusion for seepage erosion protection of streambank model under groundwater flow. Institute of Science and Engineering, Istanbul Okan University (*advisor*)
- Yüzer, Y.L., 2018. Determination of hydraulic and mechanical properties of fiber reinforced sand and its use for erosion protection under groundwater seepage flow. Institute of Science and Engineering, Istanbul Okan University (*advisor*)
- Pusar, M., 2017. Investigating the behavior of geotextile and geocomposite drains used at the base of sandy embankments under seepage flow by laboratory tests. Institute of Science and Engineering, Istanbul Okan University (*co-advisor*)
- Elbeyli, Y., 2016. Investigating the behavior of geotextile reinforced marginal embankments under seepage flow by laboratory tests. Institute of Science and Engineering, Istanbul Okan University (*co-advisor*)
- Ateş, Y., 2016. Investigating interface shear strength properties of interlocked EPS block–sand interface by laboratory tests. Institute of Science and Engineering, Istanbul Okan University (*co-advisor*)
- Koç, Ş., 2015. The investigation of using EPS block geofoam and sand + EPS bead mixtures for sandy slopes subjected to seepage by laboratory physical slope models. Institute of Science and Engineering, Istanbul Okan University (*co-advisor*)

#### Committee Member for M.Sc. Thesis

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- Usturbelli, E., 2017. Kilitli EPS blok-yerinde dökme beton ve kilitli EPS blok-prekast beton arayüz kayma mukavemetinin laboratuvar deneyleri ile incelenmesi. Institute of Science and Engineering, Istanbul Okan University (*advisor: A.T. Özer*)

- Aliyazıcıoğlu, H., 2016. The use of EPS-block geofoam in flat-roof applications as lightweight fill. Institute of Science and Engineering, Istanbul Okan University (*advisor: A.T. Özer*)
- Ermiş, I.S., 2015. Determination of flood prone areas with topographic wetness indices in the river basins. Graduate School of Science, Engineering and Technology, Istanbul Technical University (*advisor: H. Aksoy*)

#### Courses Taught at IOU

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- Undergraduate courses: Introduction to Civil Engineering (CE101), Fluid Mechanics (CE204), Probability and Statistics (MATH265), Hydraulics (CE301), Hydrology (CE302), Water Resources Engineering (CE407), Open Channel Flow (CE466)
- Graduate courses (*in Turkish*): Groundwater Hydraulics (CE521), Geotextiles in Hydraulic Structures (CE522)

#### Courses taken at UM & ITU

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- Computational River Dynamics, 2-D River Flow Modeling, Water Quality Modeling, Water Resources Engineering, Advanced Numerical Methods, Heat Transfer, Numerical Heat Transfer and Fluid Flow, Open Channel Hydraulics and Sediment Transport (UM)
- Engineering Mathematics, Probabilistic Methods in Civil Engineering, Lake Hydraulics, Management of Coastal Regions, Port and Dock Construction, Groundwater Hydrology, Sediment Transport in Coastal Regions, Harbor Structures, Methods of Wave Analysis in Coastal Structures, Marine Geomechanics, Coastal Data Management Systems, Applied Statistical Methods in Civil Engineering, Offshore Engineering (ITU)

#### Memberships

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- ASCE-American Society of Civil Engineers & EWRI-Environmental & Water Resources Institute (member ID: 431081)
- ASABE-American Society of Agricultural and Biological Engineers (member ID: 1031158)
- ASFPM-Association of State Floodplain Managers (member ID: 25956)
- SIGMA XI-The Scientific Research Society (member ID: 20061840005)
- CHI EPSILON-National Civil Engineering Honor Society
- IGS-International Geosynthetics Society (member ID: 10092)
- EGU-European Geosciences Union (member ID: 416831)
- IAHR-International Association for Hydro-Environment Engineering and Research (member ID: 61836)
- IMO-Turkish Chamber of Civil Engineers (member ID: 52658)
- TUHK-Turkish National Hydrology Commission Groundwater Task Committee member

#### Awards Received

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- ‘Excellence in Innovation and Leadership’ award received from Post, Buckley, Schuh & Jernigan, Inc., April 2009.
- ‘Best Presentation in Environmental Sciences’ award received from Chapter of Sigma Xi Student Research Symposium, April 2006.
- ‘1<sup>st</sup> place graduate’ award received from the Department of Civil Engineering, Dokuz Eylül University (among 113 graduates), July 2000.