





EDWARD BEIGHLEY

360 Huntington Ave., Boston 
MA 02115
(617) 373-3368 
r.beighley@northeastern.edu 
www.civ.neu.edu 



SUMMARY

Edward Beighley is an Associate Professor and the Associate Chair of Undergraduate Studies in the Department of Civil and Engineering at Northeastern University. He is also an affiliated faculty member in the Department of Marine and Environmental Sciences at Northeastern University. Before joining Northeastern, he was an Associate Professor in the Civil, Construction and Environmental Engineering Department at San Diego State University.

His research integrates satellite remote sensing and numerical modeling to characterize hydrologic hazards and risks for current and future climate and land use conditions. His use of remote sensing enables the development of novel applications that support the design and management of civil infrastructure in developing regions where in-situ data are often limited. Beighley's research builds on his experience working in the insurance industry, where he served as the technical lead for hydrological science research at FM Global, the worldwide leader in commercial and industrial property insurance. He blends both his academic and industrial experience to develop novel applications to enable sustainable and resilient communities.

His research portfolio is diverse with funding from national, state and local agencies, private industry and non-profit organizations. He received the National Air and Space Administration's prestigious New Investigator Award and his most recent projects include NASA grants supporting the Surface and Ocean Water Topography (SWOT) mission, the Gravity Recovery and Climate Experiment mission, and the Terrestrial Hydrology Program. For the SWOT mission, he is one of only two Applications Scientists and a member of the science team.



SKILLS

- Expert on flood hazard and risk mapping and hydrologic/hydraulic modeling
- Unique blend of academic and commercial experience on the development and implementation of flood hazard and risk mapping approaches that integrate remote sensing and numerical modeling
- Remote sensing applications: Applications Scientist for NASA's forthcoming Surface Water and Ocean Topography (SWOT) Mission
- In-depth experience in spatial and temporal data analysis and hydrologic/hydraulic modeling



EXPERIENCE

Associate Professor, Dept. of Civil and Environmental Engineering | Northeastern University

2013-PRESENT

Edward Beighley is an Associate Professor in the department of Civil and Environmental Engineering at Northeastern University. His research, teaching and community engagement focus on the design and management of civil infrastructure, with a specific focus on characterizing hydrologic hazards using a combination of remote sensing and modeling in developing regions with limited in-situ data.

Associate Chair of Undergraduate Studies, Dept. of Civil and Environmental Engineering | Northeastern University

2017-PRESENT

As Associate Chair of Undergraduate Studies, Beighley is focused on innovations in engineering education and developing new interdisciplinary degree programs that support the planning, design and management of sustainable and resilient infrastructure. He oversees innovations in both the Civil Engineering and Environmental Engineering degree programs. He led the development of the newly approved Environmental Engineering program and serves on the College of Engineering and University undergraduate studies committees.

Affiliated Faculty, Dept. of Marine and Environmental Sciences | Northeastern University

2016-PRESENT

The department of Marine and Environmental Sciences at Northeastern University and their Marine Science Center is a global leader in the area of urban coastal sustainability, seeking to forge interdisciplinary collaborations that produce solutions for cleaner, safer, and smarter coastal communities. Beighley's collaborations serve to enable innovative solutions for the sustainability and resilience of coastal communities that integrate both science and engineering.

Technical Lead, Hydrological Sciences Research, Center of Property Risk Solutions | FM Global

2011-2013

FM Global is a worldwide leader in commercial and industrial property insurance. Beighley served as the technical lead of hydrologic research and developed their multi-scaled (local, regional and global) research program for assessing flood hazards and risks. He performed detailed flood hazard/risk studies for areas where projected losses exceeded \$Billions, and developed flood modeling and mapping methodologies for areas with limited or no in-situ data.

Assistant/Associate Professor, Civil, Construction and Environmental Engineering | San Diego State University

2004-2011

Edward Beighley was an Assistant (2004-2009) and then Associate (2009-2011) Professor with tenure in the department of Civil, Construction and Environmental and Engineering at San Diego State University. He also served the Associate Chair (2009-2010) and Interim Chair (2010-2011) of the department. His research, teaching and community engagement focused on the design and management of civil infrastructure, which a specific emphasis on hydrologic hazards. He was also the Director of the Soil Erosion Research Laboratory, where he oversaw research working closely with industry that advanced construction site sediment and erosion control practices. He was also involved in advancing both undergraduate and graduate curriculum.

Post-Doctorial Researcher, Marine Science Institute and Institute for Computational Earth System Science | University of California, Santa Barbara

2001-2004

As a post-doc in the Marine Science Institute (2001-2003), Beighley was supported by the NSF funded Santa Barbara Coastal LTER project. He was responsible for quantifying the terrestrial export of water to coastal zone. He assisted in the design, installation and maintenance of the streamflow and rainfall monitoring sites. Beighley developed and implemented hydrologic models for the semi-arid coastal watersheds. As a post-doc in the Institute for Computational Earth System Science (2003-2004), he developed a vertical water balance and lateral routing model for the Amazon Basin, which would eventually become the Hillslope River Routing (HRR) model.



EDUCATION

Ph.D., Civil and Environmental Engineering | University of Maryland

YOG: 2001

M.S., Civil and Environmental Engineering | Pennsylvania State University

YOG: 1996

B.S., Civil and Environmental Engineering | Pennsylvania State University

YOG: 1995



SELECT PUBLICATIONS

- Hossain, F., Beighley, E., Burian, S., Chen, J., Mitra, A., Niyogi, D., Pielke, R. A., Wegner, D. (2017). "A review of Approaches and Recommendations for Improving Resilience of Water Management Infrastructure: The Case for Large Dams," J. Infrastructure Systems, DOI:10.1061/(ASCE)IS.1943-555X.0000370.
- Zhao, Y., and Beighley, R.E. (2016). "Scaling Surface Runoff Routing Processes in Large Scale Hydrologic Models: Application to the Ohio River Basin," J. Hydrologic Engineering, DOI:10.1061/(ASCE)HE.1943-5584.0001478.
- Feng, D., Beighley, R.E., Hughes, R., and Kimbro, D. (2016). "Spatial and Temporal Variations in Freshwater Inputs to the Eastern US Coastal Ecosystem," Journal of the American Water Resources Association, DOI:10.1111/1752-1688.12445.
- Alsdorf, D., Beighley, R.E., Laraque, A., Lee, H., Tshimanga, R., O'Loughlin, F., Mahe, G. Dinga, B., Moukandi, G., & Spencer, R. (2016). "Opportunities for Hydrologic Research in the Congo Basin," Reviews of Geophysics, DOI:10.1002/2016RG000517.
- Sorribas, M., Paiva, R.C.D., Melack, J., Jones, C., Carvalho, L., Bravo, J.M., Beighley, R.E., Forsberg, B., & Costa, M. H. (2016): "Projections of Climate Change Effects on Discharge & Inundation in the Amazon River Basin," Climatic Change, DOI:10.1007/s10584-016-1640-2.
- Ray, R., Beighley, R.E., and Yoon, Y. (2016): "Integrating Runoff Generation and Flow Routing in Susquehanna River Basin to Characterize Key Hydrologic Processes Contributing to Maximum Annual Flood Events," J. Hydro. Eng., DOI:10.1061/(ASCE)HE.1943-5584.0001389.
- Yoon, Y., Beighley, R. E., Lee, H., Pavelsky, T., Allen, G. (2015): "Estimating Flood Discharges in Reservoir-regulated River Basins by Integrating Synthetic SWOT Satellite Observations and Hydrologic Modelling," J. Hydro. Eng., DOI:10.1061/(ASCE)HE.1943-5584.0001320.
- Hossain, F., Arnold, J., Beighley, E. R., Brown, C., Burian, S., Chen, J., Mitra, A., Niyogi, D., Pielke, R. A., Tidwell, V., and Wegner, D. (2015): "What Do Experienced Water Managers Think of Water Resources of Our Nation and Its Management Infrastructure?" PLoS ONE, DOI:10.1371/journal.pone.0142073.
- Seyyedi, H., Anagnostou, E. N., Beighley, R. E., and McCollum, J. (2015): "Hydrologic Evaluation of the Satellite and Re-analysis Precipitation Datasets over Mid-Latitude Basins," Atmospheric Research, DOI:10.1016/j.atmosres.2015.03.019.
- Hossain, F., Arnold, J., Beighley, R. E., Brown, C., Burian, S., Chen, J., Madadgar, S., Mitra, A., Niyogi, D., Pielke, R., Tidwell, V., and Wegner, D. (2015): "Local-To-Regional Landscape Drivers Of Extreme Weather And Climate: Implications for Water Infrastructure Resilience", J. Hydrologic Engineering, DOI:10.1061/(ASCE)HE.1943-5584.0001210.
- Beighley, R. E., Eggert, K., Wilson, C. J., Rowland, J. C., and Lee, H. (2015): "A Hydrologic Routing Model Suitable for Climate Scale Simulations of Arctic Rivers: Application to the Mackenzie River Basin," Hydrological Pro., 29(12):2751-2768, DOI:10.1002/hyp.10398.
- Yoon, Y., and Beighley, R. E. (2015): "Simulating Streamflow on Regulated Rivers using Characteristic Reservoir Storage Patterns Derived from Remotely Sensed Water Surface Elevations," Hydrological Processes, 29:2014-2026, DOI:10.1002/hyp.10342.

- Pavelsky, T., Durand, M. T., Andreadis, K. M., Beighley, R. E., Paiva, R. C. D., Allen, G. H., and Miller, Z. F. (2014): “Assessing the Potential Global Impact of SWOT River Observations,” *Journal of Hydrology*, DOI:10.1016/j.jhydrol.2014.08.044.
- Beighley, R. E., Ray, R. L., He, Y., Lee, H., Schaller, L., Durand, M., Andreadis, K. M., Alsdorf, D. E., and Shum, C. K. (2011): “Comparing Satellite Derived Precipitation Datasets using the Hillslope River Routing (HRR) Model in the Congo River Basin,” *Hydrological Processes*, DOI:10.1002/hyp.8045/.
- Beighley, R. E., and He, Y. (2009): “Predicting Model Uncertainty at River Junctions due to Drainage Network Structure,” *J. Hydro. Eng.*, DOI:10.1061/(ASCE)HE.1943-5584.0000007.
- Beighley, R. E., Dunne, T., and Melack, J. (2008): “Impacts of Climate Variability and Land use Alterations on Frequency Distributions of Terrestrial Runoff Loading to Coastal Waters in Southern CA,” *J. Am. Water Res. Ass.*, DOI:10.1111/j.1752-1688.2007.00138.x.
- Kram, M., Sirivithayapakorn, S., & Beighley, E. (2005): “GIS Based Real-Time Monitoring & Reporting System,” U.S. Patent & Trademark Office, Utility Patent No. 6915211.



SELECT FUNDED RESEARCH GRANTS

- NASA, Surface Water and Ocean (SWOT) Mission Science Team, “Integrating lateral contributions and longitudinal controls along river reaches to improve SWOT discharge estimates” (2016-2019) – Role: PI
- NASA, SWOT Science Team, “Integration of SWOT Measurements into global hydrologic models” (2016-2019) – Role: Co-PI
- NASA, Terrestrial Hydrology, “Decomposing the Water Storage Signal from Basins in Varied Climate Settings with Remote Sensing and Modeling” (2012-2017) – Role: PI
- NASA, Gravity Recovery And Climate Experiment (GRACE) Mission Science Team, “Enhancement of GRACE Temporal Gravity Field Solutions to Study Terrestrial Water Dynamics in the Congo Basin” (2012-2017) – Role: Co-PI
- NASA, Terrestrial Hydrology, “Evaluating SWOT observations of river discharge & their implications for large scale hydrological estimation & prediction” (2012-2015) – Role: Co-PI
- FM Global, Center of Property Risk Solutions, “Application of Pfafstetter flood cells maps for continental US” (2009-2010) Role: PI
- NASA, New Investigator Award, Water and Energy Cycles Program, “Understanding hydrologic scaling in varied landscapes for improved realism in global simulation models” (2006-2009) – Role: PI
- Groundswell Technologies, Inc., “Developing ArcGIS Extension for Real-time Sensor Data Interpolation” (2006-2009) – Role: PI



SELECT SYNERGISTIC ACTIVITIES

- Applications Scientist for NASA's SWOT (Surface Water Ocean Topography mission) Satellite Mission currently scheduled to launch in 2021 (2016 - current).
- Chair, NASA’s SERVIR Surface Water and Flood Extent Monitoring Mapping, and Modeling Technical Assessment Committee (2015-2016).
- Invited Participant, Science for Nature and People’s (SNAP) Western Amazonia Climate Change Working Group at the National Center for Ecological Analysis and Synthesis, Santa Barbara, CA, to investigate how to best balance conservation and management of the Amazon's wetlands and fisheries with large-scale infrastructure development (such as hydroelectric dams, roads and hydrocarbon exploitation) to improve economies and living conditions for the region's rural and urban populations. (2014-current).
- Associate Editor, American Society of Civil Engineers' *J. Hydrologic Eng.* (2014-current).
- Chair, American Society of Civil Engineers' Environmental and Water Resources Institute, Technical Conference Chair for 2011 ASCE-EWRI's Water Congress.
- Investigator, NSF funded Santa Barbara Coastal - Long Term Ecological Research Project, University of California, Santa Barbara, CA, Role - Simulating terrestrial export to coastal ecosystem (2004-current).