

Curriculum Vitae

Taehee Hwang

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Education

Ph.D. Geography, University of North Carolina at Chapel Hill, 2010
M.C.P. City Planning (*Summa Cum Laude*), Seoul National University, South Korea, 2004
B.S. Microbiology, Seoul National University, South Korea, 2000

Research Interests

- Vulnerability of freshwater resources by the combined impacts of climate and land-use/land-cover changes
- Spatial and temporal patterns of vegetation under topography and hydroclimate setting
- Risk assessment of hydrologic extremes: droughts and landslides

Employment

Associate Professor, Department of Geography, Indiana University Bloomington, 2020-present
Assistant Professor, Department of Geography, Indiana University Bloomington, 2014-2020
Adjunct Faculty, Department of Earth and Atmospheric Sciences, Indiana University Bloomington, 2019-present
Associate Director, Center for the Analysis of Social-Ecological Landscapes (CASEL), Indiana University Bloomington, 2015-present
Post-doctoral Fellow, Institute for the Environment, University of North Carolina at Chapel Hill, 2010-2014

Peer-reviewed Journal Articles (underline represents postdoctoral or graduate advisees)

- Khodae, M., Hwang, T., Kim, J., Norman, S.P., Robeson, S., Song, C. 2020. Monitoring Forest Infestation and Fire Disturbance in the Southern Appalachian Using Time Series Analysis of Landsat Imagery, *Remote Sensing*, 12, 2412.
- Valenza, J., Edmonds, D.A., Hwang, T., Roy, S. 2020. River avulsion style depends on channel morphology. *Nature Communications*, 11, 1-8.
- Hwang, T.**, Band, L.E., Miniati, C.F., Vose, J.M., Knoepp, J.D., Song, C., Bolstad, P. 2020. Climate change may increase the drought stress of mesophytic trees downslope with ongoing forest mesophication under a history of fire suppression. *Frontiers in Forests and Global Change*, 3, 17.
- Zhang, Y., Dannenberg, M.P., **Hwang, T.**, Song, C. 2019. El Niño–Southern Oscillation-induced variability of terrestrial gross primary production during the satellite era. *Journal of Geophysical Research–Biogeosciences*, 124, 2419-2431.
- Lin, L., Band, L.E., Vose, J.M., **Hwang, T.**, Miniati, C.F., Bolstad, P.V. 2019. Ecosystem processes at the watershed scale: Influence of flowpath patterns of canopy ecophysiology on emergent catchment water and carbon cycling. *Ecohydrology*, e2093.
- Hwang, T.**, Martin, K.L., Vose, J.M., Wear, D., Miles, B., Kim, Y., Band, L.E. 2018. Non-stationary hydrologic behavior in forested watersheds is mediated by climate-induced changes in growing season length and subsequent vegetation growth. *Water Resources Research*, 54, 5359-5375. (*Water Resources Research* Editors' Choice Award in 2019) (Featured in [2018 USDA Research Highlights](#))
- Kim, J., **Hwang, T.**, Yang, Y., Schaaf, C.L., Boose, E., Munger, W.J. 2018. Warming-induced earlier greenup leads

- to reduced stream discharge in a temperate mixed forest catchment. *Journal of Geophysical Research—Biogeosciences*, 123, 1960-1975.
- Dannenberg, M., Wise, E., Janko, M., **Hwang, T.**, Smith, W. 2018. Atmospheric teleconnection influence on North American land surface phenology. *Environmental Research Letters*, 13, 034029.
- Kim, J., Hwang, T.**, Schaaf, C.L., Kljun, N., Munger, W.J. 2018. Seasonal variation of source contributions to eddy-covariance CO₂ measurements in a mixed hardwood-conifer forest. *Agricultural and Forest Meteorology*, 253-254, 71-83.
- Hwang, T., Gholizadeh, H.**, Sims, D., Novick, K., Brzostek, E.R., Phillips, R.P., Roman, D.T., Robeson, S.M., Rahman, A. 2017. Capturing species-level drought responses in a temperate deciduous forest using ratios of photochemical reflectance indices between sunlit and shaded canopies. *Remote Sensing of Environment*, 199, 350-359.
- Martin, K.L., **Hwang, T.**, Vose, J.M., Coulston, J.W., Wear, D.N., Miles, B., Band L.E. 2017. Watershed impacts of climate and land use change depend on magnitude and spatial distribution. *Ecohydrology*, e1870. (Featured in [USDA CompassLive](#)) (Top 20 most downloaded paper in the journal)
- Kim, J., Hwang, T.**, Schaaf, C., Orwig, D., Boose, E., Munger, J. 2017. Increased water yield due to the hemlock woolly adelgid (HWA) infestation in New England. *Geophysical Research Letters*, 44, 2327-2335. (Featured in [AGU Blogosphere](#) and in the [journal cover page](#)) (Multiple news reports in [IU newsroom](#) and [Science Magazine](#), [Science Daily](#), [Northern Woodlands](#), and others)
- Creed, I.F., **Hwang, T.**, Lutz, B., Way, D. 2015. Climate warming causes intensification of the hydrological cycle in northern forests. *Hydrological Processes*, 29, 3519–3534.
- Lin, L., Webster, J.R., **Hwang, T.**, Band, L.E. 2015. Effects of lateral nitrate flux and instream processes on dissolved inorganic nitrogen export in a forested catchment: a model sensitivity analysis. *Water Resources Research*, 51, 2680-2695.
- Hwang, T.**, Band, L.E., Hales, T.C., Miniati, C.F., Vose, J.M., Bolstad, P.V., Miles, B., Price, K. 2015. Simulating vegetation controls on hurricane-induced shallow landslides with a distributed ecohydrological model. *Journal of Geophysical Research—Biogeosciences*, 120, 361-378.
- Dannenberg, M.P., Song, C., **Hwang, T.**, Wise, E. 2015. Empirical evidence of El Niño—Southern Oscillation influence on land surface phenology and productivity in the western United States. *Remote Sensing of Environment*, 159, 167-180.
- Band, L.E., McDonnell, J.J., Duncan, J., Barros, A., Bejan, A., Burt, T., Dietrich, W.E., Emanuel, R.E., **Hwang, T.**, Katul, G., Kim, Y., McGlynn, B., Miles, B., Porporato, A., Scaife, C., Troch, P.A. 2014. Ecohydrological flow networks in the subsurface. *Ecohydrology*, 7, 1073-1078. (Invited commentary)
- Hwang, T.**, Band, L.E., Miniati, C.F., Song, C., Bolstad, P.V., Vose, J.M., Love, J. 2014. Divergent phenological response to hydroclimate variability in forested mountain watersheds. *Global Change Biology*, 20, 2580-2595. (Featured in [USDA CampusLive](#), [Phys.org](#), [Envirobites](#), and [UNC Chapel Hill News](#))
- Zhou, L., Tian, Y., Myneni, R.B., Ciais, P., Saatchi, S., Liu, Y.Y., Piao, S., Chen, S., Vermote, E.F., Song, C., **Hwang, T.** 2014. Widespread Decline of Congo Rainforest Greenness in the Last Decade. *Nature*, 509, 86-90. ([Selected as NEWS&VIEWS paper](#); Chambers, J.Q., Roberts, D.A. 2014. Ecology: Drought in the Congo Basin, *Nature*, 509, 36-37) (Featured in [NASA News Release](#), [New York Times](#), [Science Daily](#), and many others)
- Tang, G., **Hwang, T.**, Pradhanang, S.M. 2014. Does consideration of water routing affect simulated water and carbon dynamics in terrestrial ecosystems? *Hydrology and Earth System Sciences* 18, 1423-1437.
- Song, C., Dannenberg, M.P., **Hwang, T.** 2013. Optical remote sensing of terrestrial ecosystem primary productivity. *Progress in Physical Geography*, 37, 834-854.
- Hwang, T.**, Band, L.E., Vose, J.M., Tague, C. 2012. Ecosystem processes at the watershed scale: Hydrologic vegetation gradient as an indicator for lateral hydrologic connectivity of headwater catchments. *Water Resources Research*, 48, W06514. ([Featured article in Editor's Highlights](#) - 'Remote sensing of hydrological connectivity' in EOS Transactions 93, American Geophysical Union, and Top weekly download for three weeks in the journal)

- Mittman, T., Band, L.E., **Hwang, T.**, Smith, M.L. 2012. Distributed Hydrologic Modeling in the Suburban Landscape: Assessing Parameter Transferability from Gauged Reference Catchments. *Journal of the American Water Resources Association*, 48, 546-557.
- Band, L. E., **Hwang, T.**, Hales, T.C., Vose, J., Ford, C.R. 2012. Ecosystem processes at the watershed scale: Mapping and modeling ecohydrological controls of landslides, *Geomorphology*, 137, 159-167.
- Hwang, T.**, Song, C., Bolstad, P., Band, L.E. 2011. Downscaling real-time vegetation dynamics by fusing multi-temporal MODIS and Landsat NDVI in topographically complex terrain. *Remote Sensing of Environment*, 115, 2499-2512.
- Hwang, T.**, Song, C., Vose, J.M., Band, L.E. 2011. Topography-mediated controls on local vegetation phenology estimated from MODIS vegetation index. *Landscape Ecology*, 26, 541-556.
- Hwang, T.**, Band, L.E., Hales, T.C. 2009. Ecosystem processes at the watershed scale: Extending optimality theory from plot to catchment. *Water Resources Research*, 45, W11425. (Top 5 download across all AGU journals for two weeks)
- Hales, T.C., Ford, C.R., **Hwang, T.**, Vose, J.M., Band, L.E. 2009. Topographic and ecologic controls on root reinforcement, *Journal of Geophysical Research–Earth Surface*, 114, F03013.
- Hwang, T.**, Kang, S., Kim, J., Kim, Y., Lee, D., Band, L.E. 2009. Evaluating drought effect on MODIS gross primary production (GPP) with an eco-hydrological model in the mountainous forest, East Asia. *Global Change Biology*, 14, 1037–1056.
- Lee, B., Kang, S., Kim, E., **Hwang, T.**, Lim, J., Kim, J. 2007. Evaluation of a hydro-ecologic Model, RHESys (Regional Hydro-Ecologic Simulation System): parameterization and application at two complex terrain watersheds. *Korean Journal of Agricultural and Forest Meteorology*, 9, 247-259. (Korean with English Abstract)
- Chae, N., Kim, R., Suh, S., **Hwang, T.**, Lee, J., Son, Y., Lee, D., Kim, J. 2005. Inter-comparison of chamber methods for soil respiration measurement in a phytotron system. *Korean Journal of Agricultural and Forest Meteorology*, 7, 107-114. (Korean with English Abstract)

Manuscripts under review

- Song, Y., Zajic, C.J., **Hwang, T.**, Hakkenberg, C.R., Zhu, K. Phenological shift lagging behind climate change in human-dominated landscapes.
- Zhang, Y., Song, C., **Hwang, T.**, Novick, K., Coulston, J., Vose, J.M., Dannenberg, M., Hakkenberg, C., Mao, J., Woodcock, C. Land use/cover change-induced decline in terrestrial gross primary production over the conterminous United States from 2001 to 2016. *Submitted to Agricultural and Forest Meteorology*

Peer-reviewed Book Chapter or Proceedings

- Song, C., Chen, J.M., **Hwang, T.**, Gonsamo, A., Croft, H., Zhang, Q., Dannenberg, M., Zhang, Y., Hakkenberg, C., Li, J. 2016. Ecological Characterization of Vegetation Using Multi-Sensor Remote Sensing in the Solar Reflective Spectrum. In *Land Resources Monitoring, Modeling, and Mapping with Remote Sensing: Remote Sensing Handbook*, CRC Press.
- Park, S., Kang, M., Lim, J-H., Chun, J-H., Park, S., Kim, Y., **Hwang, T.**, Chae, N., Choi, T., Kang, S., Kim, H., Moon, S-K., Yuan, R., Yoo, J., Kim, J. 2007. Seasonal Variations in Leaf Area Index at the Gwangneung Forest Catchment. *Proceedings in Korean Meteorological Society*. 454-455. (in Korean)
- Lee, D., Kang, S., **Hwang, T.** 2003. Forested watersheds and water cycle, in *Forest, Water, and Culture* (S. Lee Ed.), Sumun Publication, Seoul, Korea (in Korean)

Google Scholar Citation Report: <http://scholar.google.com/citations?user=eA0gQG0AAAAJ&hl=en>

External Funding

- National Aeronautics and Space Administration (NASA) Carbon Cycle Science program, “Impacts of Climate

and Land-Use/Land-Cover Change on Gross and Net Primary Productivity in the Southeastern USA”, 2017-2021, Institutional Principal Investigator (\$919,212 total, \$436,669 to IU)

- *National Science Foundation (NSF) Long-Term Ecological Research (LTER) program*, “Coweeta LTER VIIb - The Interacting Effects of Hydroclimate Variability and Human Landscape Modification in the Southern Appalachian Mountains”, 2016-2021, Co-Principal Investigator (\$1.3M total, \$57,589 to IU)
- *USDA Forest Service*, “Modeling the ecohydrological interactions among land use change, climate variability, and forest condition in the Yadkin-Pee Dee river basin”, 2014-2019, Principal Investigator (\$100,000 to IU)
- *USDA Forest Service, Oak Ridge Institute for Science and Education (ORISE) Post-doctoral fellowship*, 2014, (\$70,000 per year) (relinquish due to the other tenured-track offer)

Internal Funding

- [*Indiana University Grand Challenge Initiative Prepared for Environmental Change*](#), “River and Landscape Modeling”, 2018-2022, co-Principal Investigator, (\$138,502 in Year 2)
- [*Indiana University Grand Challenge Initiative Prepared for Environmental Change*](#), “Evaluating hydrologic effects of *Paulownia tomentosa* invasion following wildfire”, 2017-2020, Principal Investigator (\$70,643 to PI until Year 4)

Invited Talks or Workshops

- Hwang, T.**, 2021. (*Symposium Invitee*) Monitoring Forest Infestation and Fire Disturbance in the Southern Appalachian Using Time Series Analysis of Landsat Imagery, *The US-International Association for Landscape Ecology (IALE) Annual Symposium*, online. (Scheduled)
- Hwang, T.** 2020. Ecohydrological processes at the watershed scale: linking vegetation dynamics with watershed-scale hydrologic behavior. *Department of Geography*, University of Wisconsin, Milwaukee, WI, USA.
- Hwang, T.**, Band, L.E., Miniati, C.F., Kneopp, J.D. Vose, J.M, Knoepp, J.D., Song, C., Bolstad, P.V. 2019. Canopy density patterns at the catchment scale homogenize with decreased hydrologic downslope subsidy. *12th North American Forest Ecology Workshop*, Flagstaff, AZ, USA.
- Hwang, T.** 2019. Ecohydrological processes at the watershed scale: linking vegetation dynamics with watershed-scale hydrologic behavior, *Department of Civil and Environmental Engineering*, Yonsei University, Seoul, Korea.
- Hwang, T.** 2019. Capturing species-level drought responses in a temperate deciduous forest using ratios of photochemical reflectance indices between sunlit and shaded canopies, *College of Agriculture and Life Sciences*, Seoul National University, Seoul, Korea.
- Hwang, T.** 2019. Ecohydrological processes at the watershed scale: linking vegetation dynamics with watershed-scale hydrologic behavior, *School of Civil, Architectural, and Environmental Engineering*, Sungkyunkwan University, Suwon, Korea.
- Hwang, T.** 2019. Ecohydrological processes at the watershed scale: linking vegetation dynamics with watershed-scale hydrologic behavior, *Department of Environmental Sciences*, Kangwon National University, Chuncheon, Korea.
- Hwang, T.**, Band, L.E., Miniati, C.F., Kneopp, J.D. Vose, J.M, Song, C., Bolstad, P.V. 2018. Warming temperature homogenizes landscape vegetation patterns at the catchment scale. *6th Interagency Conference on Research in the Watersheds*, Shepherdstown, WV, USA.
- Hwang, T.** 2017. Ecohydrological processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems. *Department of Earth Sciences*, Indiana University Purdue University at Indianapolis (IUPUI), IN, USA.
- Hwang, T.** 2017. (*Workshop invitee*) Ecohydrological processes at the watershed scale: linking vegetation dynamics with watershed-scale hydrologic behavior, *Joseph W. Jones Ecological Research Center*, Newton, GA, USA.

- Hwang, T.** 2017. Ecosystem processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems. *Department of Geography*, University of Wisconsin, Madison, WI, USA.
- Hwang, T.** 2016. Simulating vegetation controls on hurricane-induced shallow landslides with a distributed ecohydrological model. *Department of Geological Sciences*, Indiana University Bloomington, IN, USA.
- Hwang, T.** 2016. (*Workshop invitee*); Hydrologic connectivity: Bridging terrestrial and aquatic ecosystems in a karst landscape, *Joseph W. Jones Ecological Research Center*, Newton, GA, USA.
- Hwang, T.** 2013. Ecosystem processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems, *Curriculum for the Environment & Ecology*, University of North Carolina at Chapel Hill, NC, USA.
- Hwang, T., Band, L.E., Song, C., Bolstad, P.V., Vose, J.M., Love, J., Ford, C.R.** 2013. (*Symposium Invitee*) Hydroclimatic controls on leaf senescence in a humid temperate broadleaf forest, *The US-International Association for Landscape Ecology (IALE) Annual Symposium*, Austin, TX, USA.
- Hwang, T.** 2013. Ecosystem processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems, *Department of Environmental, Earth, and Ocean Sciences*, University of Massachusetts Boston, MA, USA.
- Hwang, T.** 2013. Ecosystem processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems, *Department of Geography*, University of Alabama, AL, USA.
- Hwang, T., Band, L.E., Vose, J.M.** 2012. Ecosystem processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems, *CUAHSI 3rd Biennial Colloquium on Hydrologic Science and Engineering*, Boulder, CO, USA.
- Hwang, T.** 2012. Ecosystem processes at the watershed scale: Co-evolution of hydrology, forest canopy, and geomorphic systems, *Department of Earth and Environmental Sciences*, University of Waterloo, ON, Canada.
- Hwang, T., Band, L.E., Song, C., Bolstad, P.V.** 2011. Integration of real-time vegetation dynamics into a distributed ecohydrological model by fusing multi-temporal MODIS and Landsat NDVI, *AGU Fall Meeting*, San Francisco, CA, USA.
- Hwang, T.** 2010. Integration of spatio-temporal vegetation dynamics into a distributed ecohydrological model: Application to optimality theory and real-time watershed simulations, *Graduate School of Environmental Studies*, Seoul National University, Seoul, Korea.

Dissertation and Thesis

- Hwang, T.** 2010. "Integration of spatio-temporal vegetation dynamics into a distributed ecohydrological model: Application to optimality theory and real-time watershed simulations." A dissertation for fulfillment of a Doctor of Philosophy degree in the Department of Geography, University of North Carolina at Chapel Hill., Supervisor. Dr. Lawrence E. Band.
- Hwang, T.** 2004. "Spatial analysis of carbon and water processes with RHESSys model in the Gwangneung experimental forest, Korea." A thesis for fulfillment of a Masters of City Planning degree in the Graduate School of Environmental Studies, Seoul National University, Supervisor. Dr. Downon Lee.

Awards and Honors

- Water Resources Research Editors' Choice Award* – given to about 1% of published articles each year (2019)
- USDA Forest Service, Oak Ridge Institute for Science and Education (ORISE) Post-doctoral fellowship*, (relinquish due to the other tenured-track offer) (\$70,000 per year) (2014)
- Featured Article of Editor's Highlight – Water Resources Research* (2012)
- Scholars for Tomorrow Fellowship*, University of North Carolina at Chapel Hill (2007) (\$5,000)
- Student Travel Grant*, Binghamton Geomorphology Symposium (2005)
- Graduated *Summa Cum Laude* (2004)
- Best Student Presentation Award*, Korea-Japan Joint Symposium of Limnology (2004)
- Graduate School Fellowship for Top Graduate Student*, Graduate School of Environmental Studies, Seoul National

University (three times – total about \$6,000)
LG Electronics Student Fellowship, Department of Microbiology, Seoul National University (about \$1,000)
Department Fellowships, Department of Microbiology, Seoul National University (totals \$3,000)

Conference and Meeting Proceedings, Posters, and Abstracts (underline represents advisees)

- Benson, M., **Hwang, T.**, Novick, K. 2020. Drought tolerance in the context of ongoing Eastern US oak decline: Are *Quercus* species less likely to die from drought than co-occurring non-oak species? *American Geophysical Union (AGU) Fall Meeting*, online.
- Benson, M., **Hwang, T.**, Novick, K. 2020. Drought tolerance in the context of ongoing Eastern US oak decline: Are *Quercus* species less likely to die from drought than co-occurring non-oak species? *Ecological Society of America (ESA) Annual Meeting*, online.
- Song, Y., Zajic, C.J., **Hwang, T.**, Zhu, K. 2019. Is plant phenology keeping pace with the climate? *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T.**, Martin, K.L., Vose, J.M., Wear, D., Miles, B., Kim, Y., Band, L.E. 2019. Non-stationary hydrologic behavior in forested watersheds is mediated by climate-induced changes in growing season length and subsequent vegetation growth. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA.
- Hwang, T.**, Band, L.E., Miniati, C.F., Kneopp, J.D. Vose, J.M, Knoepp, J.D., Song, C., Bolstad, P.V. 2019. Canopy density patterns at the catchment scale homogenize with decreased hydrologic downslope subsidy. *Ecological Society of America (ESA) Annual Meeting*, Louisville, KY.
- Khodaei, M., **Hwang, T.**, Kim, J., Norman, S., Thompson, S. 2019. Using Landsat Time Series Imagery to Evaluate Hemlock Woolly Adelgid Infestation Patterns over Southern Appalachian Mountains. *Ecological Society of America (ESA) Annual Meeting*, Louisville, KY.
- Solohin, E., **Hwang, T.**, Craft, C.B. 2019. Tidal marsh vulnerability to rising sea level along the southern coast of North Carolina: A 30-year record of change. *Southeastern Estuarine Research Society Semi-annual Meeting*, Wilmington, NC.
- Hwang, T.**, Gholizadeh, H., Sims, D., Novick, K., Brzostek, E.R., Phillips, R.P., Roman, D.T., Robeson, S.M., Rahman, A. 2018. Capturing species-level drought responses in a temperate deciduous forest using ratios of photochemical reflectance indices between sunlit and shaded canopies. *American Geophysical Union (AGU) Fall Meeting*, Washington DC.
- Khodaei, M., **Hwang, T.**, Kim, J., Norman, S., Thompson, S. 2018. Using Landsat Time Series to Evaluate Hemlock Woolly Adelgid Infestation over Southern Appalachian Mountains. *American Geophysical Union (AGU) Fall Meeting*, Washington DC.
- Lapham, M., **Hwang, T.**, Miniati, C.F., Denham, S.O. 2018. Comparing water use of *Paulownia tomentosa* to co-occurring native species in the Southern Appalachian Mountains. *American Geophysical Union (AGU) Fall Meeting*, Washington DC.
- Edmonds, D.A., Valenza, J., Roy, S., **Hwang, T.** 2018. Fingerprinting River Avulsions. *AGU Fall Meeting*, Washington DC.
- Martin, K.L., Vose, J.M., **Hwang, T.**, Coulston, J.W., Band L.E., Wear, D.N. 2018. Can reduced forest density increase resilience to severe drought in municipal water supply watersheds across a gradient of urbanization? *AGU Fall Meeting*, Washington DC.
- Lin, L., Band, L.E., Vose, J.M, **Hwang, T.**, Miniati, C.F., Bolstad, P.V. 2018. Forest water use and carbon cycling trait diversity impacts on watershed hydrologic and ecosystem dynamics. *AGU Fall Meeting*, Washington DC.
- Zhang, Y., Dannenberg, M.P., Song, C., **Hwang, T.** 2018. The linkage of global GPP variation to ENSO during the satellite era, *AGU Fall Meeting*, Washington DC.
- Dannenberg, M. P., Wise, E. K., Janko, M., **Hwang, T.**, Smith, W. K. 2018. Atmospheric teleconnection influence on North American land surface phenology. *AGU Fall Meeting*, Washington DC.
- Valenza, J., Edmonds, D.A., Roy, S., **Hwang, T.** 2018. Fingerprinting River Avulsions. *Geological Society of America Annual Meeting*, Indianapolis, Indiana.

- Kim, J., Hwang, T., Schaaf, C., Kljun, N., Munger, W. 2018. Seasonal variation of source contributions to eddy-covariance CO₂ measurements in a mixed hardwood-conifer forest, *Ameriflux PI Meeting*, Bloomington, IN.
- Kim, J., Hwang, T., Yang, Yun, Schaaf, C., D., Boose, E., Munger, J.W. 2018. Warming-induced earlier greenup leads to reduced stream discharge in a temperate mixed forest catchment. *Annual Coweeta LTER Meeting*, Otto, NC.
- Hwang, T., Band, L.E., Miniati, C.F., Kneopp, J.D. Vose, J.M, Song, C., Bolstad, P.V.** 2018. Warming temperature homogenizes landscape vegetation patterns at the catchment scale. *Association of American Geographers*, New Orleans, LA.
- Kim, J., Hwang, T., Yang, Yun, Schaaf, C., D., Boose, E., Munger, J.W. 2018. Warming-induced earlier greenup leads to reduced stream discharge in a temperate mixed forest catchment. *Association of American Geographers*, New Orleans, LA.
- Hwang, T., Band, L.E., Miniati, C.F., Kneopp, J.D. Vose, J.M, Song, C., Bolstad, P.V.** 2017. Warming temperature homogenizes landscape vegetation patterns at the catchment scale. *Winter Coweeta LTER Meeting*, Otto, NC.
- Hwang, T., Gholizadeh, H., Sims, D., Brzostek, E.R., Novick, K., Roman, D.T., Robeson, S.M., Rahman, A., Phillips, R.** 2017. Capturing species-level drought responses in a temperate deciduous forest using ratios of photochemical reflectance indices between sunlit and shaded canopies. *Association of American Geographers*, Boston, MA.
- Kim, Y., **Hwang, T., Vose, J.M., Martin, K.L., Band, L.E.** 2016. Characterization of SWAT hydrologic parameter sensitivity and behavior across spatial and temporal gradient, *AGU Fall Meeting*, San Francisco, CA.
- Kim, J., Hwang, T., Schaaf, C., Orwig, D., Boose, E., Munger, J.W. 2016. Assessing hydrological changes due to the Hemlock Woolly Adelgid infestation in New England using field measurements and ecohydrological modeling, *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T., Martin, K.L., Vose, J.M., Wear D.N., Miles, B., Band, L.E.** 2016. Hydrologic non-stationary behavior to climate is closely mediated by long-term vegetation dynamics in forested watersheds, *CUAHSI Biennial Meeting*, Shepherdstown, WV.
- Martin, K.L., Vose, J.M., Wear D.N., Coulston, J.W., **Hwang, T., Band, L.E.** 2016. Can forest management increase watershed drought resilience? *ESA Annual Meeting*, Fort Lauderdale, FL.
- Creed, I.F., **Hwang, T., Yulin, T.** 2015. Forest-Water Feedbacks Under a Changing Climate, *AGU Fall Meeting*, San Francisco, CA. (Invited)
- Kim, J., Schaaf, C., Hwang, T. 2015. Flux tower in a mixed forest: spatial representativeness of seasonal footprints and the influence of land cover variability on the flux measurement, *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T., Band, L.E., Miniati, C.F., Vose, J.M., Song, C., Bolstad, P.V.** 2015. Upslope vegetation shows greater response to warming than downslope vegetation, *LTER All Scientists Meeting*, Estes Park, CO.
- Martin, K.L., Vose, J.M., Coulston, J.W., **Hwang, T., Wear, D.N., Band, L.E.** 2015. Water resources in the context of land use and climate change, *Ecological Society of America Annual Meeting*, Baltimore, MD.
- Creed, F.I., **Hwang T., Yulin, T., Brimacombe, C.** 2015. Unlocking the power of many – Why inter-catchment comparisons can advance our understanding of forest hydrological resilience to climate warming, *AGU joint assembly*, Montreal, Canada.
- Hwang, T., Band, L.E., Miniati, C.F., Song, C., Bolstad, P.V., Vose, J.M., Love, J.** 2015. Divergent phenological response to hydroclimate variability in forested mountain watersheds. *Association of American Geographers*, Chicago, IL.
- Hales, T.C., Miniati, C.F., **Hwang, T., Band, L.E.** 2015. Estimating hillslope-scale soil strength for regional landslide forecasting, *European Geophysical Union*, Vienna, Austria.
- Kim, J., **Hwang, T., Wang, Z., Yang, Y., Rouhani, S., Schaaf, C.** 2014 Assessing Phenological Controls on Carbon and Water Fluxes Using a Process-based Ecohydrological Model Incorporating Field Observations and Remote Sensing Data, *AGU Fall Meeting*, San Francisco, CA.
- Martin, K., Vose, J.M., **Hwang, T., Coulston, J., Band, L.E. Wear, D.** 2014. Impacts of climate and land use change on future water resources in the Yadkin River Basin, North Carolina, *AGU Fall Meeting*, San Francisco, CA.

- Hwang, T.**, Band, L.E., Miniati, C.F., Song, C. 2013. Frequent summer droughts homogenize landscape vegetation patterns at the catchment scale, *AGU Fall Meeting*, San Francisco, CA.
- Band, L.E., **Hwang, T.** 2013. Remembrance of ecohydrologic extremes past, *AGU Fall Meeting*, San Francisco, CA.
- Yang, Y., Schaaf, C., Tague, C., Tenenbaum, D.E., Wang, Z., Douglas, E.M., Chen, R.F., Cialino, K.T., **Hwang, T.** 2013. Sensitivity analysis and simulation for DOC concentration and flux in the stream in the Regional Hydro-Ecological Simulation System (RHESSys), *AGU Fall Meeting*, San Francisco, CA.
- Dannenberg, M., Song, C., **Hwang, T.** 2013. Difference in land surface phenology and primary productivity in the western United States during El Niño and La Niña events from 2000-2012, *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T.** 2013. Hydrosphere and Vegetation Interactions in a Changing Climate: Using Technology to Promote Climate Literacy, *NASA's Innovations in Change Education program*, Institute for the Environment, University of North Carolina at Chapel Hill, NC.
- Miles, B., **Hwang, T.**, Band, L.E. 2013. Stormwater pollution in suburban Baltimore ecosystems: The role of household-scale management. *Baltimore Ecosystem Study Annual Meeting*, Baltimore, MD.
- Hwang, T.**, Band, L.E., Song, C., Bolstad, P.V., Vose, J.M., Love, J.P., Ford, C.R. 2013. Landscape-scale forest senescence patterns as a diagnostic of ecosystem vulnerability to climate change. *AAG Annual Meeting*, Los Angeles, CA.
- Band, L.E., **Hwang, T.**, Hales, T.C., Ford, C.R. 2012. Ecosystem processes at the watershed scale: Geomorphic patterns and stability of forest catchment water, energy, and nitrogen use efficiency in the southern Appalachians, *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T.**, Band, L.E., Vose, J.M. 2012. Simulating transient hydrologic behaviors during forest clearcut and pine plantation with dynamic vegetation growth, *Computational Methods in Water Resources*, University of Illinois at Urbana-Champaign, Urbana, IL.
- Hwang, T.**, Song, C., Bolstad, P.V., Band, L.E. 2012. Hydrologic Vegetation Gradient as an Indicator for Lateral Hydrologic Connectivity of Headwater Catchments, *AAG Annual Meeting*, New York City, NY.
- Hwang, T.**, Song, C., Bolstad, P.V., Band, L.E. 2010. Precipitation controls on vegetation phenology in a temperate broadleaf forest estimated from MODIS vegetation index, *AGU Fall Meeting*, San Francisco, CA.
- Band, L.E., **Hwang, T.**, Duncan, J.M., Tague, C. 2010. Coupled ecosystem-geomorphic controls on the generation and transport of nitrogen through watersheds, *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T.**, Band, L.E. 2010. Hydrologic gradients of vegetation density as an indicator for lateral connectivity of headwater catchments, *CUAHSI biennial meeting*, Boulder, CO.
- Hwang, T.**, Bolstad, P., Band L.E. 2010. Evaluation of phenological signals estimated from MODIS vegetation index with continuous PAR measurements, *Coweeta LTER Science Meeting*, Coweeta Hydrologic Lab, NC.
- Hwang, T.**, Song, C., Band L.E. 2010. A catchment-scale simulation of a distributed ecohydrological model with assimilating global satellite products by downscaling techniques, *Association of American Geographers (AAG) annual meeting*, Washington DC.
- Band L.E., **Hwang, T.** 2010. Climate, geomorphic and species controls on transient canopy development and soil water, carbon and nutrient cycling following disturbances, *Association of American Geographers (AAG) annual meeting*, Washington DC.
- Hwang, T.**, Band L.E. 2009. A simulation of a distributed eco-hydrological model with assimilating global satellite products by downscaling techniques, *Second International Conference on Forests and Water in a Changing Environment*, Raleigh, NC.
- Hwang, T.**, Band L.E., Song, C. 2009. Topography-mediated controls on local vegetation phenology estimated from MODIS vegetation index, *Coweeta LTER Science Meeting*, Coweeta Hydrologic Lab, NC.
- Band, L.E., **Hwang, T.** 2009. The Catena Concept Revisited: Spatial Optimization of Ecohydrologic Form and Function, *EGU General Assembly*, Vienna, Austria.
- Hwang, T.**, Hales, T.C., Band, L.E. 2008. Regression Analysis of Root and Soil Depth Measurements with Vegetation Factors, *Coweeta LTER Annual Meeting*, Coweeta Hydrologic Lab, NC.

- Hwang, T.**, Band, L.E. 2008. A simulation of a distributed eco-hydrological model with assimilating global satellite products by downscaling techniques, *CUAHSI Biennial Colloquium on Hydrologic Science and Engineering*, Boulder, CO.
- Hwang, T.**, S. Kang, J. Kim, Y. Kim, D. Lee, L. Band. 2008. Evaluating drought effect on MODIS Gross Primary Production (GPP) with an eco-hydrological model in the Mountainous Forest, East Asia, *AGU Joint Assembly*, Ft. Lauderdale, FL.
- Hwang, T.**, Hales, T.C., Band L.E. 2007. Long-term Ecohydrologic Pattern Optimization at the Hillslope Scale, *AGU Fall Meeting*, San Francisco, CA.
- Shin, D., **Hwang, T.**, Band, L.E. 2007. Towards More Usable and Extendable Watershed Model: an Experience to Integrate RHESSys for HydroMet Forecasting System, *AGU Fall Meeting*, San Francisco, CA.
- Hales, T., **Hwang, T.**, Band, L.E., Vose, J.M., Doyle, M.W. 2007. How changes in hydrology and vegetation control slope stability, *AGU Fall Meeting*, San Francisco, CA.
- Band, L.E., Shin, D., **Hwang, T.**, Goodall, J.L., Reed, M., Rynge, M., Stillwell, L., Galluppi, K. 2007. HydroMet: Real-time Forecasting System for Hydrologic Hazards, *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T.**, Band, L.E. 2007. Ecohydrologic pattern optimization at the hillslope scale: Implications for ecosystem management and restoration, *Coweeta LTER Science Meeting*, Coweeta Hydrologic Lab, NC.
- Band, L.E., **Hwang, T.**, Hales, T.C., Shin, D., Reed, D., Rynge, M., Doyle, M.W., Stillwell, L., Galluppi, K. 2007. Integration of ecohydrologic and geomorphic processes within a distributed watershed model: Applications to the prediction of ecosystem patterns, runoff production and landslide risk, *Coweeta LTER Science Meeting*, Coweeta Hydrologic Lab, NC.
- Band, L.E., **Hwang, T.** 2006. Ecohydrologic pattern optimization at the hillslope scale: Implications for ecosystem management and restoration in the Anthropocene, *AGU Fall Meeting*, San Francisco, CA.
- Shin, D., **Hwang, T.**, Band, L.E. 2006. How to detect vegetation controls on evapotranspiration loss and improve physical process modeling? *AGU Fall Meeting*, San Francisco, CA.
- Hwang, T.**, Band, L.E. 2006. Comparison of MOD17 and Distributed Ecohydrological Simulation of Water and Carbon Flux during Extreme Drought, *Global Vegetation Workshop*, Missoula, MT.
- Hwang, T.**, Shin, D., Band, L.E. 2006. Signals of Hydrologic Responses to Climatic Changes and External Disturbances, *AGU Joint Assembly*, Baltimore, MD.
- Hwang, T.**, Band, L.E., Song, C. 2006. Estimating Spatial Pattern of Vegetation Species by ZELIG Model with Spatially Distributed Micro-climate Data and Soil Moisture Information, *2nd Interagency Conference on Research in the Watersheds*, Coweeta Hydrologic Lab, NC.
- Shin, D., **Hwang, T.**, Band, L.E. 2006. Integrated climate and geomorphic controls on space-time variability in coupled canopy and soil water, carbon and nutrient cycling in an experimental watershed, *European Geophysical Union*, Vienna, Austria.
- Hwang, T.**, Band, L.E., Shin, D. 2005. Integrating Spatial Ecosystem Information to Calibration of Watershed Models, *Binghamton Geomorphology Symposium*, Buffalo, NY.
- Hwang, T.**, Band, L.E., Shin, D. 2005. Integrating Spatial Ecosystem Information to Calibration of Watershed Models, *Gordon Research Conference*, Colby college, ME.
- Shin, D., Band, L.E., **Hwang, T.** 2005. Toward more usable environmental model: an experience to integrate RHESSys to CatchLab, *AAG Annual Meeting*, Denver, CO.
- Kang, S., Eum, S., **Hwang, T.**, Kim, D., Mu, S., Lee, D. A combined effect of climate and topography on inter-annual spatial patterns of net primary production in a rugged temperate forested landscape, *International Conference on High-Impact Weather and Climate*, Seoul, Korea.
- Hwang, T.**, Kang, S., Kim, D., Lee, D. 2003. Incorporation of satellite image into an eco-hydrological model to analyze carbon and water processes in the Gwangneung experimental forest, Korea, *Workshop on Flux Observation and Research in Asia*, Beijing, China.
- Kim, J., Kim, K., **Hwang, T.**, Lee, D. 2003. Validation of the MODIS LAI with the NDVI evaluated from the finer resolution satellite image, *Workshop on Flux Observation and Research in Asia*, Beijing, China.

Hwang, T., Eum, S., Lee, D. 2002. Field and laboratory experiments for parameterizing soil variables at complex terrain, *RHESSys workshop*, Missoula, MT.

Courses Taught

- Indiana University Bloomington
 - Mapping Our World (GEOG 237) - fall 2014, 2018, 2019, 2020
 - Environmental Remote Sensing (GEOG 336/535) - fall 2015, 2016, 2017
 - Geographic Information System (GEOG 338/538) - fall 2015
 - Advanced Remote Sensing (GEOG 436/536) - spring 2015, 2016, 2017, 2018, 2019, 2020
 - GIS and Environmental Analyses (GEOG 439/639) - fall 2017, 2019, 2020
 - Ecohydrology (GEOG 467/567) - fall 2016, 2018, spring 2020
- University of North Carolina at Chapel Hill (UNC)
 - Introduction to Watershed Systems (GEOG 441) - fall 2011
- Main Lecturer of short workshop or boot camp
 - RHESSys ecohydrological model bootcamps - 2009, 2010, 2013, and 2015
 - LiDAR workshop at CASEL lab in Indiana University Bloomington - 2017

Post-doctoral Research Associates and Graduate Students Supervision

- Ruhui Chai (PhD in Geography, IU): 2019-current
- Sasha Siani (PhD in Geography, IU, co-advisee): 2018-current
- Mahsa Khodaei (PhD in Geography, IU): 2017-current
- Marika Lapham (MS in Geography, IU): 2017-current
- David Massey (PhD in Geography, IU, co-advisee): 2015-current
- Mallory Barnes (Post-doctoral fellow, IU, co-advisee): 2018-2019
- Jihyun Kim (Post-doctoral fellow, IU): 2015-2018
- Anika Tabassum (MS in Geography, IU, co-advisee): graduated 2017
- Committee members
 - Elena Solohin (PhD in SPEA, IU - Minor advisee): 2016-current
 - Anas Rabie (PhD in Geology, IU - Minor advisee): 2016-current
 - Jeff Valenza (PhD in Geology, IU - Minor advisee): 2017-current
 - Mackenzie Cory (PhD in Anthropology, IU - Minor advisee): 2017-current
 - Sander Denham (PhD in SPEA, IU): 2017-current
 - Igor Ogashawara (PhD in Earth Sciences, IUPUI): 2017-current
 - Meghan Engh (PhD in Geography, IU): 2019-current
 - Dan Myers (PhD in Geography, IU): 2019-current
 - Samapriya Roy (PhD in Geography, IU): graduated 2019
 - Michelle VanCompernelle (MS in Geography, IU): graduated 2018
 - Koong Li (PhD in SPEA, IU): graduated 2018
 - Trevis Matheus (PhD in Geography, IU): graduated 2017
 - Hamed Gholizadeh (PhD in Geography, IU): graduated 2016
 - William Burke (MS in Geography, IU): graduated 2016
 - Jihyun Kim (PhD in Geography, Boston University): graduated 2015

Professional Service

- Editorial Board
 - Frontiers in Forest and Global Change* (Review Editor): 2018-current
- Served as a reviewer more than 50 times (*frequent reviewer)

*Water Resources Research**, *Remote Sensing of Environment**, *Journal of Geophysical Research – Biogeosciences**, *Ecological Applications*, *Global Change Biology*, *Geophysical Research Letters*, *Hydrological Processes*, *Advances in Water Resources*, *Ecohydrology*, *PLOS one*, *Forest Ecology and Management*, *Agricultural and Forest Meteorology*, *Hydrology and Earth System Sciences*, *Environmental Modeling and Software*, *Science of the Total Environment*, *Environmental Research Letters*, *Remote Sensing, GIScience & Remote Sensing*, *One book chapter (Cambridge University Press)*

- Served as an ad-hoc reviewer for proposals
 - NSF Hydrology program* (2016, 2017, and 2020)
 - NSF Frontier Research in Earth Science (FRES) program* (2019)
 - NSF Geography and Spatial Science (GSS) program* (2015, 2016, and 2018)
 - National Geographic Information Institute (Korea), National Atlas of Korea* (2017)
 - Ball State University ASPiRE Grants program* (2015)
 - Environmental Protection Agency* (2013)
 - Georgia Water Resources Institute* (2012)
- Served as a reviewer for student paper awards and travel grants
 - Korean-American Geospatial and Environmental Sciences (KAGES)* (2015-2020)
 - AGU Outstanding Student Paper Award* (judge) (2012, 2013, 2018, 2019)
 - AAG Student Paper Competition, Biogeography Specialty Group* (judge) (2016)
- Session organizer/convenor
 - ‘Advancing Science through Long-Term Monitoring, Observation, and Experimentation in Catchment, Critical Zone, and Ecosystem Studies I, II, and III’ at the *American Geophysical Union (AGU) Meeting*, 2019, San Francisco, CA
 - ‘Climate Change at Long-Term Ecological Research (LTER) Sites’ at the *LTER All Scientists’ Meeting*, 2018, Asilomar, CA
 - ‘Using Long-term Data on Assessing Extreme Climatic Events Effects on Watershed Processes, Functions and Management Practices’ at the 6th *Interagency Conference on Research in the Watersheds (ICRW)*, 2018, West Virginia
 - ‘Detection of drought-induced changes in terrestrial ecosystems using remote sensing data I & II’ at the *Association of American Geographers (AAG) Meeting*, 2017, Boston, MA, USA
 - ‘Changing dynamics of complex eco-hydrological system’ at the *American Geophysical Union Fall Meeting*, 2010, San Francisco, CA

Campus and Departmental Service

Bachelor of Science in Environmental Science (BSES) curriculum committee, IU Bloomington (2018-2019)
New Master’s in GIS (MGIS) committee, IU Geography (2017-2019)
Department salary committee, IU Geography (2018)
Geography colloquium committee (co-chair), IU Geography (2017-2019)
Department search committee, IU Geography (2017)
Associate Director, Center for the Analysis of Social-Ecological Landscapes (CASEL), IU (2015-present)
Advisory board in undergraduate enrollment committee, IU Geography (2014-2016)
Advisory board in environmental quality and land use group, IU Bloomington (2014-2016)
IU GIS day planning committee, IU Bloomington (2014-2016)

Professional Memberships

American Geophysical Union (AGU)
Association of American Geographers (AAG)
Ecological Society of America (ESA)
US Regional Association of the International Association for Landscape Ecology (US-IALE)

