YOUNG GU HER

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Agricultural and Biological Engineering Department
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EMPLOYMENT

- Assistant Professor   Aug 2016 – Present
  Tropical Research and Education Center &
  Department of Agricultural and Biological Engineering
  University of Florida, Homestead, Florida
- Assistant Research Scientist   Nov 2014 – July 2016
  Blackland Research and Extension Center
  Texas A & M University, Temple, Texas
- Post-doctoral Associate   Feb 2011 – Oct 2014
  Department of Agricultural and Biological Engineering
  Purdue University, West Lafayette, Indiana
- Researcher and Assistant Manager   Mar 2002 – Jun 2006
  Department of Water Resource and Environment
  Dong-Bu Engineering Co., Ltd., Seoul, Republic of Korea (South Korea)

EDUCATION

- Doctor of Philosophy   Aug 2006 – May 2011
  Department of Biological Systems Engineering (Land and Water Division)
  Virginia Polytechnic Institute and State University, Blacksburg, Virginia
  Dissertation: HYSTAR- Hydrology and Sediment Transport Simulation using Time-Area Method
- Secondary Major: GSCR – Graduate Certificate Program (Secondary College: Interdisciplinary)
  Concentration: GITC – Geospatial Information Technology Certificate
- Master of Science in Engineering   Mar 2000 – Feb 2002
  Department of Agricultural Engineering
  Seoul National University, Seoul, Republic of Korea (South Korea)
  Thesis: Application of a GIS-based Soil Loss Estimation System
- Bachelor of Science in Engineering   Mar 1995 – Feb 2000
  Department of Agricultural Engineering
  Seoul National University, Seoul, Republic of Korea (South Korea)

PUBLICATIONS

Publications in peer-reviewed journals

- **Her, Y.** and J. Jeong, SWAT+ versus SWAT2012: Comparison of sub-daily urban runoff simulations. *Transactions of ASABE*, In Press.
- **Her, Y.** and C. Seong, Responses of hydrological model equifinality, uncertainty, and performance to multi-objective parameter calibration. *Journal of Hydroinformatics*, In Press. DOI: 10.2166/hydro.2018.108.
- Song, J., Y. **Her**, J. Park, and M. Kang (2017) Simulink implementation of hydrologic model: A tank model case study, *Water*, 9(9), 639. doi:10.3390/w9090639.
- **Her, Y.**, J. Jeong, J. Arnold, L. Gosselink, R. Glick, and F. Jaber (2017) Assessing effectiveness of decentralized low impact development practices: a new LID modeling framework using Soil and

Water Assessment Tool, *Environmental Modeling and Software* 96, 305-322. https://doi.org/10.1016/j.envsoft.2017.06.005.

- **Her, Y.**, J. Jeong, J. Arnold, and R. Srinivasan, (2017) Implications of conceptual channel representation on SWAT streamflow and sediment modeling, *Journal of the American Water Resources Association*, 53(4), 725-747. DOI: 10.1111/1752-1688.12533.
- **Her, Y.**, I. Chaubey, J. Frankenberger, and J. Jeong (2017), Implications of spatial and temporal variation in effects of conservation practices on water management strategy, *Agricultural Water Management* 180, 252-266. http://doi.org/10.1016/j.agwat.2016.07.004.
- Wang, R., L. C. Bowing, K. A. Cherkauer, C. Raj, **Y. Her**, and I. Chaubey (2017), Biophysical and hydrological effects of future climate change including trends in CO_2, in the St. Joseph River watershed, Eastern Corn Belt, *Agricultural Water Management* 180, 280-296. http://dx.doi.org/10.1016/j.agwat.2016.09.017.
- Cho, J., D., **Y. Her**, and D. Bosch (2017), Sensitivity of simulated conservation practice effectiveness to representation of field and in-stream processes in the Little River watershed, *Environmental Modeling and Assessment* 22(2), 159-173. doi: 10.1007/s10666-016-9530-6.
- **Her, Y.**, and C. D. Heatwole (2016), Comparing impacts of parameter and spatial data uncertainty for a grid-based distributed watershed model, *Journal of Hydroinformatics* 18(6), 961-974. doi: 10.2166/hydro.2016.003.
- Kang, M. S., P. Srivastava, J. H. Song, J. Park, **Y. Her**, S. M. Kim, and I. Song (2016), Development of a component-based modeling framework for agricultural water-resource management, *Water* 8(8), 351. doi:10.3390/w8080351.
- **Her, Y.**, I. Chaubey, and J. Frankenberger (2016), Effect of conservation practices implementation by USDA programs at field and watershed scales, *Journal of Soil and Water Conservation* 71(3), 249-266. doi: 10.2489/jswc.71.3.249.
- **Her, Y.**, and C. D. Heatwole (2016), HYSTAR sediment model: Distributed two-dimensional simulation of watershed erosion and sediment transport using time-area routing, *Journal of the American Water Resources Association* 52(2), 376-396. doi: 10.1111/1752-1688.12396.
- **Her, Y.**, and C. Heatwole (2016), Two-dimensional continuous simulation of spatiotemporally varied hydrological processes using the time-area method, *Hydrological Processes* 30(5), 751-770. doi: 10.1002/hyp.10644.
- **Her, Y.**, C. Seong, J. Jeong (2016), Alternative CN averaging methods for unbiased direct runoff depth estimation: Quadratic averaging and exact methods, *Journal of Irrigation and Drainage Engineering* 142(6), doi: 10.1061/(ASCE)IR.1943-4774.0001021, 06016004.
- **Her, Y.**, and I. Chaubey (2015), Impact of the numbers of observations and calibration parameters on equifinality, model performance, and output and parameter uncertainty, *Hydrological Processes* 29(19), 4220-4237, doi: 10.1002/hyp.10487.
- **Her, Y.**, C. D. Heatwole, and M. S. Kang (2015), Interpolating SRTM elevation data to a higher resolution to improve hydrologic analysis, *Journal of the American Water Resources Association*, 51(4): 1072-1087, doi: 10.1111/jawr.12287.
- Feng, Q., I. Chaubey, **Y. Her**, R. Cibin, B. Engel, J. Volenec, and X. Wang (2015), Hydrologic/water quality impacts and biomass production potential on marginal land, *Environmental Modeling and Software* 72, 230-238. doi:10.1016/j.envsoft.2015.07.004
- **Her, Y.**, J. Frankenberger, I. Chaubey, and R. Srinivasan (2015), Threshold effects in HRU definition of the Soil and Water Assessment Tool, *Transactions of ASABE* 58(2): 367-378, doi: 10.13031/trans.58.10805.

- Seong, C. H., **Y. Her**, and B. L. Benham (2015), Automatic calibration tool for Hydrologic Simulation Program – FORTRAN using Shuffled Complex Evolution algorithm, *Water* 7(2), 503-527. doi:10.3390/w7020503.
- **Her, Y.**, I. Chaubey., and C. Raj (2015), Application of parallel computing methods for improving efficiency of optimization in hydrologic and water quality modeling, *Advanced Engineering in Agriculture* 31(3), 455-468. doi: 10.13031/aea.31.10905.
- **Her, Y.**, and S. Hwang (2015), Evaluating applicability of sediment transport capacity equations through sensitivity analysis, *Journal of the Korean Society of Agricultural Engineers* 57(6), 79-90. doi: 10.5389/KSAE.2015.57.6.079.
- **Her, Y** (2015), Evaluating hydrologic behavior of Hydrology Simulation using Time Area (HYSTAR) model through sensitivity analysis, *Journal of the Korean Society of Agricultural Engineers* 57(3), 41-54. doi: 10.5389/KSAE.2015.57.3.041.
- Cho, J., **Y. Her**, and D. Bosch (2015), Assessing applicability of SWAT calibrated at multiple spatial scales from field to stream, *Journal of the Korean Society of Agricultural Engineers* 57(3), 21-39. doi: 10.5389/KSAE.2015.57.3.021.
- Kang, M. S., J. H. Goo, I. Song, J. A. Chun, **Y. Her**, S. W Hwang, and S. W. Park (2013), Estimating design floods based on the critical storm duration for small watersheds, *Journal of Hydro-Environment Research 7*(3), 209-218. doi:10.1016/j.jher.2013.01.003.
- **Her, Y.**, and S. Yoo (2013), Evaluating applicability of SRTM DEM in hydrologic analysis: A case study of Geum River and Daedong River, *Journal of the Korean Society of Agricultural Engineers 55*(6), 101-112. doi: 10.5389/KSAE.2013.55.6.101. (In Korean)
- Hwang, S., **Y. Her**, and S. Chang (2013), Uncertainty in regional climate change impact assessment using bias-correction technique for future climate scenarios, *Journal of the Korean Society of Agricultural Engineers* 55(4), 95-106. doi: 10.5389/KSAE.2013.55.4.095. (In Korean)
- Cho, J., R. R. Lowrance, D. D. Bosch, T. C. Strickland, **Y. Her**, and G. Vellidis (2010), Effect of watershed subdivision and filter width on SWAT simulation of a coastal plain watershed, *Journal of the American Water Resources Association 46*(3), 586-602. doi: 10.1111/j.1752-1688.2010.00436.x.
- Kang, M. S., J. H. Koo, J. A. Chun, **Y. Her**, S. W. Park, and K. Yoo (2009), Design of drainage culverts considering critical storm duration, *Biosystems Engineering 104*, 425-434. doi:10.1016/j.biosystemseng.2009.07.004.
- **Her, Y.**, M. S. Kang, and S. W. Park (2006), Estimating USLE soil erosion through GIS-based decision support system, *Journal of the Korean Society of Agricultural Engineers 48*(7), 3-14. doi: 10.5389/KSAE.2006.48.7.003.
- Kang, M. S., S. W. Park, and **Y. Her** (2001), A water environment management and evaluation systems for a small watershed (2), *Journal of Korean Society of Rural Planning 7*(1), 15-25. (In Korean)

Books / Book Chapters
- **Her, Y.**, K. J. Boote, K. W. Migliaccio, C. Fraisse, D. Letson, O. Mbuya, A. Anandhi, H. Chi, L. Natia, and S. Asseng (2017) Climate Change Impacts and Adaptation in Florida's Agriculture, In Florida's Climate: Changes, Variations, and Impacts. Florida Climate Institute, Gainesville, FL.

Extension Publications
- **Her, Y.**, How likely is a 100-year rainfall event during the next ten years?, *UF/IFAS EDIS*, AE523.
- Zhang, M., **Y. Her**, K. W. Migliaccio, and C. Fraisse (2017) Florida rainfall data sources and types, *UF/IFAS EDIS*, AE517.

CONTRACTS & GRANTS

Principle Investigator
- IFAS Early Career Scientist Seed Fund (2017 to 2018): Development of a Simulation Tool for Holistic Assessment of Climate Change and Sea Level Rise Impacts on South Florida's Agriculture and Hydrology
- Ordway-Swisher Biological Station (OSBS) Research Jumpstart (2017 to 2019): Quantifying Climate Change Impacts on Ecosystem Service Dynamics in Hydrologically Connected Forest Wetland and Lake Systems
- C-111 Spreader Canal Project (2018): Groundwater Monitoring, Modeling and Analysis

Co-principle Investigator
- C-111 Spreader Canal Project (2016 to 2017): Groundwater Monitoring, Modeling and Analysis

Project Manager
- UF Office of Research / IFAS Global (2017 to 2019): USAID AREA - $60,110 for 2 academic years

EXPERIENCE

Research Experience in Academia
- Water and nutrient mass balance of South Florida   2016 – Present
  - (1) Prepare watershed models that can consider agricultural management practices in water and nutrient transport modeling for South Florida, (2) quantify water and nutrient mass balance along the flow paths from the drainage areas of Lake Okeechobee to the Everglades, and (3) identify management plans that can minimize nutrient loading to the waterbodies and the risks of flooding and drought in South Florida
- Unified fine-resolution large-scale hydrological modeling   2016 – Present
  - (1) Develop a watershed model capable of simulating hydrological processes in detail at a fine spatial resolution, (2) improve the computational efficiency of the two-dimensional overland routing of the watershed model so that fine-resolution large-scale modeling will be affordable (3) combine ecosystem service sub-models with the newly developed watershed simulation model, and (4) provide the overall picture of hydrological processes and help develop water management plans effective and consistent at multiple spatial scales
- Assessing climate change impacts on the water balance of the U.S.   2016 – Present
  - (1) Correcting biases in climate projections made for weather stations located in the contiguous U.S., (2) assessing the current water budget, and (3) evaluating climate change impact on the water budget
- Water budget of the island of Maui under climate change (Texas A&M University)   2015 – 2016
  - (1) Preparing, calibrating, and validating the SWAT model for the entire Maui island including sugarcane plantations, (2) assessing water budget and hydrologic processes of the island, and (3) evaluating climate change impact on water budget of the island
- Watershed scale LID (low impact development) modeling (Texas A&M University)   2014 – 2016
  - (1) developing new SWAT modules for simulating decentralized LIDs (green roof, rain garden, cistern, and porous pavement) and (2) maintaining existing SWAT modules for simulating LIDs (detention pond, wet pond, sedimentation-filtration basin, and retention-irrigation basin)
- Watershed modeling (Purdue University)   2011 – 2014

- o Cumulative Impacts of BMP Implementation in the Maumee River Basin (funded by USEPA)
  (1) Preparing, calibrating, and validating the SWAT model for the study watersheds and (2) evaluating effectiveness of BMPs in reducing NPS pollution using the calibrated SWAT model at field and watershed scales
- o Watershed Scale Optimization to Meet Sustainable Cellulosic Energy Crop Demand (funded by USDOE)
  (1) Preparing, calibrating, and validating the SWAT model for the study watershed, (2) incorporating downscaled climate change datasets into the model, (3) identifying marginal areas for the cellulosic bioenergy crop production
- Hydrology and sediment modeling (Virginia Tech)   2006 – 2010
  - o Investigating the impact on hydrology and sediment from cropland expansion through forest clear-cutting and burning in eastern Zambia (funded by USAID)
    (1) Hydrology and sediment transport (SWAT) modeling and data analysis, (2) analysis of topography, land cover, soil, and fire occurrence with GIS/RS data (land use/cover classification of remotely sensed imagery, interpolation of SRTM DEM, fire occurrence analysis, and compiling required information from soil database), and (3) assessing the impact of agricultural cropland expansion (corn and cotton) on hydrology and sediment transport of study watersheds
- Detection of Areal Changes in Tidal Flats after the Asan Bay Seawall Construction   2001
  - o Rectification of LANSAT imagery and delineation of tidal flats
- Development of the Flood Forecasting System for the Younsan River basin   2001
  - o System development using Visual Basic
- Assessment of Pollutant Loading by Land Use Type   2000
  - o Field monitoring and data analysis
- Monitoring and Modelling Irrigation Return Flow from Small Agricultural Watersheds   2000
  - o Field monitoring and data analysis
- Development of Comprehensive Agricultural Environmental Management System   2000
  - o System development using Visual Basic

Research Experience in Industry/the Private Sector
- Integrated Flood Management Project for the Namdea, Hwapo, and Youngwol River watersheds
                                                                          Jun 2004 – Jun 2006
  Duties: HEC-HMS and HEC-RAS modeling for stormwater detention basin design
- Evaluation of Effect on Flood Disaster for Gangwon Land Resort   Jan 2004 – Jun 2004
  Duties: HEC-HMS modeling for stormwater detention basin design
- Water Quality Prediction for the Wanjang River watershed   Jan 2003 – Dec 2003
  Duties: SWAT modeling for assessing the impact of agricultural management practices on water quality of agricultural watersheds
- Han and Nakdong River Basin Surveying and Monitoring Project   Mar 2002 – Jan 2003
  Duties: Agricultural, municipal, and industrial water use survey and data analysis for supplying fundamental data to WAMIS (http://www.wamis.go.kr/eng), which is a portal database system providing water resource information supported by Ministry of Land, Transport and Maritime Affair, South Korea

PROFESSIONAL & HONOR SOCIETY MEMBERSHIPS
- American Society of Agricultural and Biological Engineers (ASABE)
- American Water Resources Association (AWRA)

- American Geophysical Union (AGU)
- Association of Natural Resource Extension Professionals (ANREP)
- Alpha Epsilon (Honor Society for Outstanding Biological and Agricultural Engineers)