Se Jong Cho

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Profile

I develop computer simulation models to organize complex landscape information and data for the development of management scenario narratives to inform policy decision analysis. Environmental problems, such as water pollution and land degradation, are essentially social problems; thus, I continue to work in multi- and inter-disciplinary research projects where we define and address these problems in social, economic, and environmental dimensions.

Education

Johns Hopkins University Baltimore, MD
PhD Environmental Engineering and Management 2017
Dissertation: Development of an integrated environmental management simulation model to address nonpoint source sediment pollution from intensive agricultural watershed in southern Minnesota
Committee: Profs. Peter Wilcock, Benjamin Hobbs, and Ben Zaitchik,

Johns Hopkins University Baltimore, MD
MSE Environmental Management and Economics 2014

Johns Hopkins University Baltimore, MD
MS Environmental Engineering and Science 2009

Northwestern University Evanston, IL
BS Civil Engineering 2003

Professional Experience

US Geological Survey Reston, VA
Mendenhall Fellow/Research hydrologist 2020-Present
Collaborators: Drs. Katie Skalak, Jim Pizzuto, Diana Karwan

- Develop sediment transport modeling on event to millennial timescales and reach to watershed spatial scales

The National Socio-Environmental Synthesis Center, University of Maryland Annapolis, MD
Postdoctoral Research Fellow 2018-2020
Collaborating Mentors: Betsy Otto and Suzanne Ozment

Evaluation of green infrastructure impact on water resources management

- Develop simulation models to evaluate different land management scenarios on the water supply system
- Collaborate in an effort to develop a decision support system with TNC

St. Anthony Falls Laboratory, University of Minnesota Minneapolis, MN
Postdoctoral Research Associate 2017-2018
Advisors: Drs. Efi Foufoula-Georgiou, Karen Gran, Patrick Belmont, Peter Wilcock

Management of intensively managed landscape

- Collaborated in an effort to integrate multiple landscape simulation models to optimize management choices for nonpoint source sediment and nutrient source reduction
- Conducted landslide mapping using remote sensing and spatial analysis techniques

Bechtel Power Corporation Frederick, MD
Hydrologic and Hydraulic Engineer 2008-2009

Conducted hydrologic and hydraulic engineering design and analysis for multiple fossil and nuclear power projects supported by Geotechnical & Hydraulic Engineering Services of Bechtel.

Publications

Cho, S.J., Wilcock, P., Gran, K., (in prep). Implementing Landscape Connectivity with a Topographic Filtering Model.

Cho, S.J., Braudrick, C.A., Dolph, C.L., Day, S.S., Dalzell, B.J., Wilcock, P.R., 2021. Simulation of fluvial sediment dynamics through strategic assessment of stream gaging data: A targeted watershed sediment loading analysis. Journal of Environmental Management 277, 111420. doi.org/10.1016/j.jenvman.2020.111420

Lang, Z., Rabotyagov, S.S., Cho, S.J., Campbell, T., Kling, C.L., 2020. Good Seeds Bear Good Fruit: Using Benefit-to-Cost Ratios in Multiobjective Spatial Optimization under Epistasis. Land Economics 96, 531–551. doi.org/10.3368/wple.96.4.531

Cho, S.J., Wilcock, P., Belmont, P., Gran, K., Hobbs, B., 2019. Simulation model for collaborative decision-making on sediment source reduction in an intensively managed watershed. Water Resource Research. doi: 10.1029/2018WR024324

Gran, K., Dolph, C., Baker, A., Bevis, M., Cho, S.J., Czuba, J.A., Dalzell, B., Danesh-Yazdi, M., Hansen, A., Kelly, S., Lang, Z., Schwenk, J., Belmont, P., Finlay, J.C., Kumar, P., Rabotyagov, S., Roehrig, G., Wilcock, P., Foufoula-Georgiou, E., 2019. The power of environmental observatories for advancing multidisciplinary research, outreach, and decision support: the case of the Minnesota River Basin. Water Resources Research. doi.org/10.1029/2018WR024211

Cho, S. J., Wilcock, P., Hobbs, B., 2018. Topographic filtering simulation model for sediment source apportionment. Geomorphology 309C, 1-9. doi: 10.1016/j.geomorph.2018.02.014

Mitchell, N., Kumarasamy, K., Cho, S., Belmont, P., Dalzell, B., Gran, K., 2018. Reducing High Flows and Sediment Loading through Increased Water Storage in an Agricultural Watershed of the Upper Midwest, USA. Water 10(8), 1053. doi: 10.3390/w10081053

Cho, S. J., Wilcock, P., Gran, K., Belmont, P., Hobbs, B., 2017. Management Option Simulation Model (MOSM) and supporting documents. University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/191082.

Cho, S. J., 2017. Development of Data-Driven, Reduced-Complexity Watershed Simulation Models to Address Agricultural Non-Point Source Sediment Pollution in Southern Minnesota (Ph.D. Dissertation). Department of Environmental Health and Engineering, Johns Hopkins University, Baltimore, MD.

Wilcock, P., Cho, S. J., Gran, K., Hobbs, B., Belmont, P., Bevis, M., Heitkamp, B., Marr, J., Mielke, S., Mitchell, N., Kumarasamy, K., 2016. CSSR: Collaborative for Sediment Source Reduction Greater Blue Earth River Basin. A Final Report for the EPA 319, Nonpoint Source Water Pollution Project Grants. Minneapolis, Minn.

Conference Presentations

“Synthesis model development in the context of landscape management decision support system” 2019 American Geophysical Union (AGU) Annual Fall Meeting in San Francisco, CA

“Planning for sustainable water futures in the context of the Sustainable Development Goals in Sub-Saharan Africa” Session co-chair 2019 American Geophysical Union (AGU) Annual Fall Meeting in San Francisco, CA

"Finding social innovation in the nexus of science and art" International Association of Landscape Ecology (US-IALE) 2019 Annual Meeting in Fort Collins, CO. Special Symposia *Art-science collaboration for ecology, conservation, and sustainability*

"Quantification of near-channel sediment supply in deeply incising tributaries of the Minnesota River, accelerated by the anthropogenic influences on watershed hydrology" 2017 American Geophysical Union (AGU) Annual Fall Meeting in New Orleans, LA

"Simulation model to link management choices and sediment delivery" 2016 Minnesota Water Resources Conference in Saint Paul, MN. Session: *Collaborative for sediment source reduction*

"Reduced complexity model to simulate reductions in sediment delivery from an agricultural watershed in southern Minnesota" 2015 AGU Annual Fall Meeting in San Francisco, CA

"Development of a Topographic Filter to identify dominant sediment source areas in a watershed" 2012 AGU Annual Fall Meeting in San Francisco, CA

Teaching Experience

Johns Hopkins University — Baltimore, MD
Guest lecturer, *Social Theory for Engineers* — 2016
Teaching assistant, *Principals of Geomorphology* — 2013
Teaching assistant, *Introduction to Computation and mathematical modelling* — 2012
Mathematics instructor, *Trigonometry, Precalculus, Calculus* — 2003-2008

Towson University — Towson, MD
Guest lecturer, *Creativity in Arts* — 2018

Computer skills

MS Office: Word, PowerPoint, Access, and Excel Spreadsheet with VBA
Geographical and aerial analysis software: ArcGIS and ERDAS
Hydraulic and hydrologic assessment software: HEC-RAS, HEC-HMS, and SWMM
Optimization algorithm software: CPLEX
Statistical analysis software: R
Engineering software: MATLAB, Netlogo agent-based model (ABM), VenSim/STELLA
Programming language: VBA, C++, Python

References

Peter Wilcock, Department Head of Watershed Sciences at Utah State University
(435) 797-2463
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Benjamin Hobbs, Schad Professor of Environmental Management at Johns Hopkins University
(443) 465-3470
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Director of the National Socio-Environmental Synthesis Center, University of Maryland
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