Se Jong Cho 760 E. 36th Street Baltimore, MD 21218 (443) 983 – 1963 se.j.cho@gmail.com

Citizenship: Naturalized U.S. citizen since 2002

Profile: I am an environmental engineer with research interests in computer simulation modeling, and management and policy decision analysis.

EDUCATION

Ph.D., Environmental Engineering and Management **Degree conferred on May 2017**
Johns Hopkins University
Dissertation: *Development of an integrated environmental management simulation model to address nonpoint source sediment pollution from intensive agricultural watershed in southern Minnesota* (Abstract in appendix)
Advisors: Dr. Peter R. Wilcock and Dr. Benjamin F. Hobbs

MSE, Environmental Management and Economics **Degree conferred on August 2014**
Johns Hopkins University
Key modules: Risk and decision analysis; Uncertainty modeling for policy analysis and management; stochastic programming; Environmental policy analysis; Multi-objective programming and planning; Systems modeling and simulation; Numerical modeling; Mathematical models for managing urban and environmental systems; Remote sensing of environment; Microeconomics

MS, Environmental Engineering and Science **Degree conferred on May 2009**
Johns Hopkins University
Key modules: Environmental law; Environmental impact assessment; Environmental compliance management; Hydrogeology (ground water analysis); Sediment transport and river mechanics; Geomorphic and ecological foundations of stream restoration; Optimization and simulation models for public decision-making process; Hazardous waste engineering and management

BS, Civil Engineering **Degree conferred on June 2003**
Northwestern University
Key modules: Structural steel design, community-based design for green schools; Transportation planning and analysis

PROFESSIONAL EXPERIENCE

National Socio-Environmental Synthesis Center, University of Maryland 2018-
Postdoctoral fellow
Working to advance our understanding and communication of human-environment system vulnerability, and to provide a strategic framework for implementing natural-based solutions to sustainably manage water resources.

St. Anthony Falls Laboratory, University of Minnesota 2017 - 2018
Postdoctoral Research Associate
Collaborated in effort to develop genetic algorithm to optimize management choice through the development of a multi-model platform

Bechtel Power Corporation 2008 - 2009
Hydrologic & Hydraulic Engineer
Conducted hydrologic and hydraulic engineering design and analysis for multiple fossil and nuclear power projects in various U.S. locations supported by the Geotechnical & Hydraulic Engineering Services (G&HES) division.

Johns Hopkins University, Center for Talented Youth 2003 - 2008
Mathematics Instructor and program supervisor

Midwest Generation, Edison International 2003
Environmental Engineering and Energy Management Internship

National Science Foundation (NSF), Semiconductor Research Corporation (SRC) 2001
Engineering Research and Development Internship

Library of Congress 2000
Fellowship / Summer Internship

PUBLICATIONS

Cho, S., Wilcock, P., Hobbs, B., 2018. Topographic filtering simulation model for sediment source apportionment. Geomorphology 309, 1–19. https://doi.org/10.1016/j.geomorph.2018.02.014

Mitchell, N., Kumarasamy, K., Cho, S., Belmont, P., Dalzell, B., Gran, K., Mitchell, N., Kumarasamy, K., Cho, S.J., 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, 1053. https://doi.org/10.3390/w10081053

Cho, S., 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., 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., 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.

Cho, S., Brauderick, C., Dolph, C., Wilcock, P., (under review). Evaluation of Near-Channel Sediment Dynamic Using Paired Gage Data. Water Resources Research

Lang, Z., Rabotyagov, S., Cho, S., Campbell, T., Kling, C., (under review). Good seeds bear good fruit: using benefit-to-cost ratios in multiobjective spatial optimization under epistasis. Water Resource Research.

Gran, K., Dolph, C., Baker, A., Bevis, M., Cho, S., Czuba, J., Dalzell, B., Hansen, A., Kelly, S., Lang, Z., Schwenk, J., Belmont, P., Finlay, J., Kumar, P., Rabotyagov, S., Roehrig, G., Wilcock, P., Foufoula-Georgiou, E., (submitted). Data synthesis for collaborative, multidisciplinary research in an intensively managed agricultural landscape: the Minnesota River Basin environmental observatory. Water Resource Research.

Cho, S., Wilcock, P., (in preparation). Simulation model for collaborative decision-making on sediment source reduction in an intensively managed watershed. Water Resource Research

Cho, S., Wilcock, P., Gran, K., (in preparation). Sediment delivery simulation using topographic filtering

PRESENTATIONS

- Poster Presentation: *Shared understanding and emergence of stakeholder consensus: evidence-based, reduced-complexity watershed simulation model for evaluation of nonpoint source sediment pollution and management impact*. USDA NIFA and NSF Water and Soils Meeting, Washington D.C., January 2018
- Poster Presentation: Quantification of near-channel sediment supply using paired gages. Annual conference of AGU, New Orleans, December 2017
- Presentation: *Prioritizing sediment reduction strategies in a large Watershed—Simulation model to link management choices and sediment delivery*. Annual Minnesota Water Resource Conference, October 2016.
- Presentation: *Development of comprehensive environmental and decision analysis modeling system to address nonpoint source sediment pollution from agricultural watershed through participatory modeling process*. Annual conference of AGU, San Francisco, CA, December 2015
- Presentation: *Simulation and management of sediment pollution in the Greater Blue Earth River Basin of southern Minnesota*. Guest speaker at Korea University and Yonsei University, Seoul, South Korea, July 2013
- Poster Presentation: *Development of topographic filter to identify dominant sediment source Areas in a Watershed*. Annual conference of the American Geophysics Union (AGU), San Francisco, CA, December 2012
- Poster Presentation: *Development of reduced-complexity topographic filter to identify dominant areas of nonpoint source agricultural sediment pollution*. Annual graduate student conference, Pennsylvania State University, University Park, PA, April 2011
- Workshop: Conducted biannual meetings with stakeholders, consisting of farmers, conservation groups, and regulatory agencies, during my PhD research from 2012 to 2017.

RESEARCH TECHNIQUES

I am experienced and competent in research design, and the collection, analysis, assimilation, and synthesis of diverse data sources. I have extensive experience in developing landscape simulation models, including hydrologic/hydraulic routing, and nutrient/sediment pollution transport. I also worked with a large array of geospatial datasets, including meteorological, landuse, LiDAR, and satellite imagery databases. I conducted statistical and uncertainty modeling to evaluate the significance of multiple environmental attributes, including parametric (linear and nonlinear regression models) and non-parametric classifiers (CART, Random Forest).

COMPUTER SKILLS

MS Office: Word, PowerPoint, Access, and Excel Spreadsheet with macro design
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, VenSim
Programming language: VBA, C, Python
Miscellaneous: Dreamweaver, Adobe Photoshop

AWARDS

- M. Gordon Wolman Fellowship: Awarded by Robert J. Barbera '74, '78 and numerous donors in memory of Reds Wolman as the first recipient of the fellowship in October 2011
- Global Water Program for Scholarly Travel: Recipient in 2011
- Presidential Scholar: Appointed as the Montgomery College's Presidential Scholar by Dr. Charlene R. Nunley in May 2001
- Clifford K. Beck Award, Paul Peck Humanities Institute Internship Award: Awarded in June 2000 for the internship at the Library of Congress
- Undergraduate Scholarships: Honors Outstanding Student Award,Outstanding Academic Achievement Award, Gerhardt F. Meyne Company Scholarship, Bechtel Scholarship, Women in Science Scholarship, Dean's List Scholarship, AAUP Outstanding student Award, Foundation Scholarship

GRADUATE TEACHING EXPERIENCE

Johns Hopkins University

Social theory for engineers	2016
Geomorphology	2013
Computation and mathematical modeling	2012

LANGUAGES: I am fluent in Korean; written and oral.

ART: I am a professional painter with six solo exhibits and five groups shows since 2014.

REFERENCES

Peter Wilcock, Department Head of Watershed Sciences at Utah State University
(435) 797-2463
wilcock@usu.edu

Benjamin Hobbs, Schad Professor of Environmental Management at Johns Hopkins University
(443) 465-3470
bhobbs@jhu.edu

Karen Gran, Associate Professor, Department of Geological Sciences, University of Minnesota Duluth
(218) 726-7406
kgran@d.umn.edu

APPENDIX

Development of an integrated environmental management simulation model to address nonpoint source sediment pollution from intensive agricultural watershed in southern Minnesota

PhD dissertation summited to Johns Hopkins University, January 2017; Degree conferred, May 2017

Abstract

Agricultural nonpoint source sediment pollution and management has been a subject of intensive modeling and economic research. Important challenges remain for the scientific and regulatory communities in understanding, not only the mechanisms of pollution, but also different options for environmental management. To better understand nonpoint source pollution at the watershed scale and to evaluate the impacts of various management options, a data-driven, reduced-complexity modeling framework is developed through a collaborative process involving multiple scientists, engineers, and economists, as well as local stakeholders in Southern Minnesota. The models in this framework are developed by making the most effective use of abundant information on soils, topography, and sediment loading in a platform that is transparent and accessible for decision-making. The models' simulation outputs are within the constraints provided by observation and tested against independent data, thereby providing reliable and robust predictions about management impact on water quality. This modeling framework can support evaluation of different conservation scenarios to address nonpoint source sediment pollution in an agricultural watershed with simulation outputs that are relevant to environmental and social needs.