Aleksey Y. Sheshukov, Ph.D.
Biological and Agricultural Engineering
Kansas State University
129 Seaton Hall, Manhattan, KS 66506
(785)-532-5418 (voice)
(785)-532-5825 (fax)
ashesh@ksu.edu (E-mail)
http://www.bae.ksu.edu/watershed/ashesh/index.html (URL)

Research and Teaching Interests

- Watershed hydrology and sustainability under land use and climatic change conditions
- Water-quality impact assessment of non-point source pollution
- GIS in water resources
- Watershed management and restoration
- Physically-based modeling of surface and subsurface processes
- Coupled heat and mass transport in variably saturated partially frozen environments

Education

Ph.D. Environmental Fluid Mechanics, Kazan State University, Russia 1996
Dissertation: Heat and Mass Transfer in Frozen Soils (Impact of concentrated aqueous solution on frozen soils: Regelation in soils and creation of frozen barriers) 91 p. (in Russian)

M.S. Theoretical Mechanics and Applied Mathematics (*Summa Cum Laude*),
Department of Mechanics and Mathematics, Kazan State University, Russia 1991
Thesis: Advancement of mineral particles through the ice

Professional Experience

Research Assistant Professor Kansas State University, Biological and Agricultural Engineering, 2008-present (Research Associate till 2010)

Research:

- Assessment of impacts of climatic and human-altered land use changes on watershed hydrology
- Statistical downscaling of ensemble of GCMs and application to watershed response assessment in several watersheds in Kansas
- Monitoring and assessment of non-point source pollution and identification of critical areas in numerous watersheds in Kansas
- Geomorphological assessment and location identification of ephemeral gullies
- Development of ArcGIS software tools for pre- and post-processing of SWAT input/output data
- Assessment of limitations of GIS input data (soil, land use, topography) on watershed hydrologic condition and water-quality response
- Development of a model of coupled flow and heat and mass transport in variably saturated, partially frozen soils and its verification with laboratory and field data
- Development of long-term asymptotics for atrazine transport with adsorption-desorption hysteresis

Extension:

- Lead watershed assessment specialist on K-State WRAPS management team
- Co-author of 7 WRAPS Project reports and 9 WRAPS Assessment reports
- Built watershed models with SWAT for numerous watersheds in Kansas for watershed restoration and management assessment, and provided water-quality field assessment of livestock BMPs for BMP auctions in Kansas and Missouri
- Communicated with environmental agencies in Kansas (KDHE, KWO, EPA Region 7…) on various water-quality projects

Teaching:

- Taught undergraduate courses on advanced watershed modeling; water, wastewater, and watershed management; and natural resources engineering

Research Associate University of Minnesota, Bioproducts and Biosystems Engineering, 2004-2008

Research:
- Co-developed a stochastic weather generator WINDS for current and future weather forecast
- Co-developed an erosion tool WATER for environmental risk assessment
- Geomorphological and biological assessment of stream impairments and statistical analysis of the Index of Biological Integrity (IBI) in Upper Mississippi basin streams
- Studied gravity-driven infiltration in vadose zone and developed a non-equilibrium *Richards* equation model for variably saturated flows
- Numerically modeled one- and two-dimensional unstable flows in soils

Extension:
- Collaborated on erosion control strategies on construction sites with Minnesota Department of Transportation and Minnesota Pollution Control Agency
- Participated in development of a feedlot runoff evaluation tool (FleVAL) and its integration with the WATER model

Teaching:
- Taught an undergraduate course on transport processes in biological systems

Visiting Assistant Professor University of Minnesota, U.S. Army High Performance Computing Research Center, 1999-2003

Research:
- Developed a Subsurface-Earth Surface-Atmosphere module for 3-D dispersion model that ran on supercomputer
- Studied one and two dimensional coupled heat and mass transport in variably saturated freezing environments
- Modeled a process of artificial frozen barrier creation in saturated geological environments
- Developed a model for infiltration in a snowpack

Assistant Professor Kazan State Power Engineering University, Kazan, Russia 1996-1998

Teaching:
- Taught three undergraduate courses on thermodynamics, fluid mechanics, heat and mass transport

Senior Scientist (Junior Scientist 1991-1995, Scientist 1996-1998) Research Institute of Mathematics and Mechanics, Kazan, Russia 1991-1999

Research:
- Developed mathematical and numerical models of heat and mass transport in frozen soils
- Studied plume migration in permafrost
- Developed a numerical algorithm using *Multigrid* numerical scheme to solve a system of one and two-dimensional non-linear PDEs

Advising Experience

Christopher Siebenmorgen, **M.S.**, Biological & Agricultural Engineering, *Hydrologic Indices Analysis of Climate Change in a Northeast Kansas Watershed*, December 2010

Teaching Experience

BAE 669/869 – Watershed Modeling 2010, 2012 Kansas State University, Lead Co-Instructor
Summary: Undergraduate course on study and evaluation of physical processes at the watershed scale using hydrologic and water-quality models. Fundamental principles of hydrologic cycle are discussed; rainfall excess and runoff hydrographs, overland and channel flow, detention ponds, wetlands, and etc. Impacts of climate change on hydrologic regimes in Kansas are explored. In-class and homework projects on simple and complex hydrologic and watershed models: TR-55, STEPL, BASINS, and SWAT.

ATM 661 – Water, Wastewater and Watershed Management 2010, 2011 Kansas State University, Guest instructor
Summary: Multidisciplinary undergraduate course on watershed sources, fate, and transport of pollutants, with focus on issues of the prairie agroecosystem, and impacts of watershed protection and

restoration strategies on water and environmental quality. I developed a section on watershed models and environmental assessment of non-point source pollution.

BAE 660 – Natural Resources Engineering II 2009 Kansas State University, Co-Instructor
Summary: Undergraduate course on design and operative problems of irrigation/water application systems: topics on water balance; non-point source pollution and water quality; wetland and detention pond design, and hydraulic routing are discussed. WinTR-55 hydrologic model is used for design project.

BAE 4013 – Transport Processes in Biological Systems 2006 University of Minnesota, Lead Instructor
Summary: Undergraduate course on application of thermodynamics, fluid flow, heat/mass transfer to design problems involving biological processes and materials at cell, organism, and system level. Agricultural, environmental, food, and bioprocess applications are formulated and solved by analytical and numerical methods involving computer programming assignments in Visual Basic.

Fluid Mechanics 1996-1998 Kazan State Power Engineering University, Kazan, Russia, Lead Instructor
Summary: Included fluid statics, differential and finite control volume analysis with continuity, momentum, and energy equations, Bernoulli and Euler equations, incompressible viscous flow and Navier-Stokes equation, dimensional analysis, pipe flow, introduction to turbulence

Heat and Mass Transport 1996-1998 Kazan State Power Engineering University, Russia, Lead Instructor
Summary: Undergraduate course on fundamentals of transport processes, application of heat and mass transport equations to solve real-life industrial problems

Thermodynamics 1996-1998 Kazan State Power Engineering University, Kazan, Russia, Lead Instructor
Summary: Undergraduate course on fundamental principles of thermodynamics applied to the needs of power-engineering industry

Summer Campus Internship Program 2009 Kansas State University
Supervised three multicultural interns in research projects on identification of critical areas within three watersheds in east-central Kansas by utilizing ArcGIS tools

Supervisor, Summer Internship Program 2002 U.S. Army High Performance Computing Research Center
Supervised two research projects on environmental impacts of a chemical attack in metropolitan area

Honors and Awards

- **Best Watershed Plan in the USA, U.S. Environmental Pollution Agency (Team award)**, Tuttle Creek Watershed, 2011 - Lead senior personnel, K-State Research and Extension
- **Above and Beyond Award**, 2009 College of Engineering, Kansas State University
- **USDA Cooperative State Research, Education, and Extension Service (CSREES) Partnership Award for Mission Integration (Team award),** 2009 **K-State Integrated Watershed Restoration and Protection Strategies Team** – Senior personnel
- **2nd most downloaded research article**, 2002 Advances in Water Resources, Elsevier
- Selected for **Who's Who in Science and Engineering by Marquis Publishers**
- **Leonard Euler Stipendium,** 1994 German Mathematical Society, Germany
- **Award of "The Special Fund for the Award of Personal Scholarships and Grants to Gifted Young Academics"**, 1994 Moscow, Russia
- **Scholarship for Excellence in Studies**, 1986-1989 Department of Mechanics and Mathematics, Kazan State University, Russia

Professional Service

Committee Member:

- **2011/2012 ASABE Preferential Flow Meeting** planning committee
- **ASABE Standards for Model Calibration and Validation** committee

Peer reviewer of proposals:

- **National Institute for Water Resources, USGS**

Peer reviewer of research papers (watershed hydrology, hydrologic modeling, subsurface flows, transport in porous media, and other water resources subjects):

- ***Water Resources Research; Advances in Water Resources; Transactions of the ASABE; Soil Science Society of America Journal; Journal of American Water Resources Association; etc.***

Professional Membership

- **American Geophysical Union (AGU)**
- **American Society of Biological and Agricultural Engineers (ASABE)**

Professional Development

- **"Agricultural Decision Making with a Water and Climate Change Perspective"** Regional Conference, 2011, Heartland Regional Water Coordination Initiative and NOAA, Nebraska City, NE
- **"Advance the Science of Modeling"** Modeling Summit, 2011, The Soil and Water Conservation Society, Denver, CO
- **"Mathematical Modeling with MATLAB"** Workshop, 2007, 2011, MathWorks, Inc.
- **26th Annual "Water and the Future of Kansas"** Conference, 2009, Topeka, KS
- **"SWAT for beginners"** Workshop, 2008 Texas Water Resources Institute, Texas A&M
- **"SWAT for advanced users"** Workshop, 2008 Texas Water Resources Institute, Texas A&M
- **"APEX"** Workshop, 2008 Texas Water Resources Institute, Texas A&M
- **W-188** Technical Committee Annual Meeting, 2001, Las Vegas, NV

Technical Skills

Programming languages:
Object-Oriented Programming; Visual C++, C#, Basic (Visual Studio Environment); FORTRAN; MATLAB; Mathematica; COMSOL; ArcObjects; Python; etc

Watershed and Hydrologic Modeling Software:
ArcSWAT, AVSWAT, APEX, HSPF, AGNPS, WEPP, L-THIA, STEPL, RUSLE2, WinTR55, etc.

Geographical Information System:
ArcGIS, MapWindow GIS

Software Development

WINDS *Weather Input for Nonpoint Data Simulation (Co-Developer)*
This is a stochastic weather generator and a tool for prediction of daily climate variables and intra-storm characteristics. The model uses statistics of historic records to stochastically generate many years of possible weather conditions. Important features include utilization of 15-minutes precipitation data, intra-storm characteristics, IDF and DDF curves, 5-day forecast, normalized weather variables, climate change scenarios, etc. Adjustments for future climate predictions include daily scaling of weather variables, transitional probabilities, and a variable number of wet/wet or dry/wet days.

WATER *Watershed Assessment Tool for Environmental Risk (Co-Developer)*
This tool assesses effectiveness of different sediment control practices and evaluates risk by performing many simulations of a construction site response for different weather conditions generated with WINDS. The model simulates surface runoff, plant processes, and erosion and sediment transport as major hillslope processes. It uses MapWindow AcitveX control for working with GIS geospatial layers.

SWATioTools *Pre- and Post-processing Utilities for SWAT (Developer)*
http://www.bae.ksu.edu/watershed/ssurgo/index.html
A set of modeling tools to assist with input and output of the SWAT model. Core components include SSURGO soil processing utility, soil loss estimation tool, and calibration assisting utility, among others. Uses C++ language and ArcObjects framework within ArcGIS 9.xx environment.

Livestock BMP Evaluation Tool *(Developer)*
A spreadsheet tool for evaluating effectiveness of livestock conservation practices at the pasture field-scale. The tool works in conjunction with the SWAT model and estimates BMP effectiveness under current and future pasture conditions.

MULTIGRID PDE Solver *(Developer)*
A C++ DLL library for solving a system of one and two-dimensional non-linear Partial Differential Equations using Multigrid, a robust numerical method

Personal

2010 Champion of Kansas State University Chess Tournament
2011 Co-Founder of the 'Chess for Kids' Chess Club, Manhattan, Kansas

Publications

Book Chapters

1. Nieber, J.L., R.Z. Dautov, A.G. Egorov, and **A.Y. Sheshukov** (2005) Dynamic capillary pressure mechanisms for instability in gravity-driven flow; review and extension to very dry conditions, In: D.B. Das and S.M. Hassanizadeh (eds), *Upscaling Multiphase Flow in Porous Media; From Pore to Core and Beyond*, Springer, The Netherlands, pp. 147-172.
2. Nieber, J.L., **A.Y. Sheshukov**, R.Z. Dautov, and A.G. Egorov (2003) Non-equilibrium model for gravity-driven fingering in water repellent soils: Formulation and 2-D simulations, in Book*: Soil water repellency: Occurrence, Consequences and Amelioration*, Elsevier, Ch. 23, 245-258.

Refereed Publications

1. **Sheshukov**, **A.Y.**, P. Daggupati, K.R. Douglas-Mankin, and M.-C. Lee. (2011) High Spatial Resolution Soil Data for Watershed Modeling: 1. Development of a SSURGO-ArcSWAT Utility. *Journal of Natural and Environmental Sciences* (in review)
2. **Sheshukov**, **A.Y.**, P. Daggupati, and K.R. Douglas-Mankin. (2011) High Spatial Resolution Soil Data for Watershed Modeling: 2. Assessing Impacts on Watershed Hydrologic Response. *Journal of Natural and Environmental Sciences* (in review)
3. **Sheshukov**, **A.Y.**, K.R. Douglas-Mankin, P. Daggupati, and S. Sinnathamby (2011) Pasture BMP Effectiveness using a HRU-based Sub-field Approach in SWAT, *Journal of Environmental Management* (in review)
4. Daggupati, P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, and P.L. Barnes (2011) Targeting field-scale BMP placement using SWAT sediment yield estimates, *Journal of Soil & Water Conservation* (in revision)
5. **Sheshukov**, **A.Y.**, C. Siebenmorgen, and K.R. Douglas-Mankin (2011) Seasonal and Annual Impacts Of Climate Change On Watershed Response Using Ensemble Of Global Climate Models, *Transactions of the ASABE, 54(6).*
6. **Sheshukov**, **A.Y.** and J.L. Nieber (2011) Freezing of Non-heaving Unsaturated Soils: Model Formulation and Similarity Solution, *Water Resources Research,* 47. DOI:10.1029/2011WR010512
7. Daggupati, P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, P.L. Barnes, and D.L. Devlin (2011) Field-Level Targeting Using Swat: Mapping Output From HRUs to Fields And Assessing Limitations of GIS Input Data, *Transactions of the ASABE*, 54(2), 74-88.
8. Dolph, C.L., **A.Y. Sheshukov**, C.J. Chizinski, B. Vondracek, and B. Wilson (2010) The Index of Biological Integrity and the Bootstrap: Can Random Sampling Error Affect Stream Impairment Decisions? *Ecological Indicators*, 10(2). 527-537. DOI:10.1016/j.ecolind.2009.10.001
9. Nieber. J.L., R. Dautov, A. Egorov, and **A.Y. Sheshukov** (2005) Dynamic capillary pressure mechanism for instability in gravity-driven flows; Review and extension to very dry conditions, *Transport in Porous Media*, 1-2, 151-172.
10. Egorov, A., R. Dautov, J.L. Nieber, and **A.Y. Sheshukov** (2003) Stability analysis of gravity-driven infiltrating flow, *Water Resources Research*, 39, 1266. DOI:10.1029/2002WR001886
11. **Sheshukov, A.Y.** and A.G. Egorov (2002) Frozen barrier evolution in saturated porous media, *Advances in Water Resources*, 25(6), 681-689.
12. **Sheshukov, A.Y.** (1996) Heat and Mass Transfer in Frozen Soils: Impact of concentrated aqueous solution on frozen soils and phenomenon of regelation. PhD Thesis, Kazan State University, Kazan, Russia (in Russian).
13. Egorov, A.G., A. V. Kosterin, and **A.Y. Sheshukov** (1995) One-dimensional problems of frozen soil thawing due to solution seepage, *Fluid Dynamics*, 30, 767-776.
14. Egorov, A.G., A. V. Kosterin, and **A.Y. Sheshukov** (1993) Mathematical modelling of the motion of a solid inclusion in a nonisothermal block of ice, *Colloid Journal of Russian Academy of Sciences*, 55, 350-359.

15. **Sheshukov, A.Y.** (1991) Advancement of mineral particles through the ice. MS Thesis, Kazan State University, Kazan, Russia (in Russian).

Journal Articles in Preparation

1. **Sheshukov, A.Y.**, K.R. Douglas-Mankin, C. Siebenmorgen, and B.N. Wilson. Development of climate change scenarios for hydrologic modeling: Comparison of five methods, *Hydrological Processes*
2. **Sheshukov, A.Y.**, A. Egorov, and J. Nieber. Sorption Wave Propagation from An Instantaneous Solute Source With Equilibrium Adsorption-Desorption Hysteresis, *Journal of Contaminant Hydrology*

Conference Papers

1. Wilson, B.N., and **A.Y. Sheshukov** (2011) Precipitation Parameters of Stochastic Weather Models for a Changing Climate, *ASABE International Symposium on Erosion and Landscape Evolution*, Anchorage, AK, 8 p.
2. Siebenmorgen, C.B., **A.Y. Sheshukov**, and K.R. Douglas-Mankin (2010) Impacts Of Climate Change On Hydrologic Indices In A Northeast Kansas Watershed. *TMDL 2010: Watershed Management to Improve Water Quality*. Pub No. 711P0710cd. ASABE: St. Joseph, MI
3. Daggupati, P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, and P.L. Barnes (2010) Targeting BMP placement using SWAT sediment yield estimates for field-scale BMPs. *TMDL 2010: Watershed Management to Improve Water Quality*. Pub No. 711P0710cd. ASABE: St. Joseph, MI
4. Daggupati. P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, and P.L. Barnes (2010) Monitoring and Estimating Ephemeral Gully Erosion using Field Measurements and GIS. *ASABE Annual International Meeting*, Paper No. 10-9663. ASABE: St. Joseph, MI.
5. Wilson, B.N, **A.Y. Sheshukov,** and A. Mendez (2009) Simulation of Rock Infiltration Systems. *ASABE Annual International Meeting*, Paper No. 09-6995, ASABE: St. Joseph, MI.

6. Wilson, B., and **A.Y. Sheshukov** (2006) A process based erosion and sediment model for construction sites. ASCE Conf. Proc. 200, 415. DOI:10.1061/40856(200)415

Proceedings Publications

1. **Sheshukov, A.Y.**, P. Daggupati, M.-C. Lee, and K. Douglas-Mankin (2009) ArcMap Tool for Pre-processing the SSURGO Soil Database for ArcSWAT. In: *Proceedings of the 5th International SWAT Conference*, Texas Water Resources Institute, TR-356, 116-123.
2. **Sheshukov, A.Y.**, K. Douglas-Mankin, and P. Daggupati (2009) Evaluating the Effectiveness of Unconfined Livestock BMPs using SWAT. In: *Proceedings of the 5th International SWAT Conference*, Texas Water Resources Institute, TR-356, 204-211.
3. Daggupati P., **A.Y. Sheshukov**, K. Douglas-Mankin, P. Barnes, and D. Devlin (2009) Field-Scale Targeting of Cropland Sediment Yields using ArcSWAT. In: *Proceedings of the 5th International SWAT Conference*, Texas Water Resources Institute, TR-356, 76-83.
4. Dautov, R., A. Egorov, J. Nieber, and **A.Y. Sheshukov** (2002) Simulation of two-dimensional gravity-driven unstable flow. In: *Proceedings of 14th International Conference on Computational Methods in Water Resources*, Delft, The Netherlands, 1, 9-16.
5. Egorov, A., R. Dautov, J. Nieber, and **A.Y. Sheshukov** (2002) Stability analysis of traveling wave solution for gravity-driven flow. In: *Proceedings of 14th International Conference on Computational Methods in Water Resources*, Delft, The Netherlands, 1, 120-127.
6. **Sheshukov, A.Y.,** and A.G. Egorov (1998) Numerical modeling of coupled moisture, solute and heat transport in frozen soils, In: *Proceedings of 7th International Conference on Permafrost*, Yellowknife, Canada, 987-992.
7. Egorov, A.G., and **A.Y. Sheshukov** (1997) Solute movement in saturated frozen soil: self-similar solutions, In: *Proceedings of the 14th International School on Models in Continuum Mechanics*, Zhukovsky, Russia, 68-74 (in Russian).

8. Egorov, A.G., and **A.Y. Sheshukov** (1996) Freezing of porous medium due to moving solute. In: *Proceedings of Workshop "Theory of the mesh methods for non-linear boundary-value problems"*, Kazan, Russia, 53-55 (in Russian).

Extension Publications

1. Douglas-Mankin, K.R., P. Daggupati**, A.Y. Sheshukov**, P. Barnes, D. Devlin, and N. Nelson (2011) Cheney Lake Watershed: Erosion from ephemeral gullies. Publication MF-3030. Kansas State University, Manhattan, KS.

Technical Reports

1. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2011) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Milford Lake Watershed Stakeholder Leadership Team Development and Assessment Support. Final Report. KDHE Project No. 2004-0034. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
2. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2011) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Lower Big Blue River and Lower Little Blue River Watersheds Stakeholder Leadership Team Development and Assessment Support. Final Report. KDHE Project No. 2004-0032. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
3. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2011) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Neosho River Watershed Stakeholder Leadership Team Development and Assessment Support. Final Report. KDHE Project No. 2004-0044. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
4. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2011) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Toronto Reservoir Watershed Stakeholder Leadership Team Development and Assessment Support. Final Report. KDHE Project No. 2007-0031. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
5. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2011) Watershed Restoration and Protection Strategy (WRAPS) for Upper and Lower Cottonwoods Watershed. Final Report: KDHE Project No. 2007-0028. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 191 p.
6. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2011) Watershed Restoration and Protection Strategy (WRAPS) for Milford Reservoir. Final Report: KDHE Project No. 2004-0034. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 158 p.
7. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2011) Watershed Restoration and Protection Strategy (WRAPS) for Upper Neosho Watershed. Final Report: KDHE Project No. 2004-0044. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 179 p.
8. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2010) Watershed Restoration and Protection Strategy (WRAPS) for Middle Neosho Watershed. Final Report: KDHE Project No. 2004-0044. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 106 p.
9. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2010) Watershed Restoration and Protection Strategy (WRAPS) for the Lower Big Blue River and Lower Little Blue River Watersheds. Final Report: KDHE Project No. 2004-0032. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 173 p
10. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2010) Watershed Restoration and Protection Strategy (WRAPS) for the Toronto Reservoir Watershed. Final Report: KDHE Project No. 2007-0031. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 130 p.
11. Wilson, R., J. Roe, S. Brown, and **A.Y. Sheshukov** (2010) Watershed Restoration and Protection Strategy (WRAPS) for the Neosho Headwaters Watershed. Final Report: KDHE Project No. 2007-0028. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS. 126 p.

12. **Sheshukov A.Y.**, K. Douglas-Mankin, and S. Perkins (2010) Modeling of John Redmond Watershed with Soil and Water Assessment Tool (SWAT), *Final Report*, Part of John Redmond Dam and Reservoir, Kansas Watershed Feasibility Study, Kansas Water Office, Topeka, KS.
13. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2010) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Oologah Lake Watershed Stakeholder Leadership Team Development and Assessment Support. Final Report. KDHE Project No. 2006-0059. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
14. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2010) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Elk City Lake Watershed Assessment. Final Report. KDHE Project No. 2007-0061. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
15. Douglas-Mankin, K.R., **A.Y. Sheshukov**, J. Roe, R.M. Wilson, and J.C. Leatherman (2010) Kansas Watershed Restoration and Protection Strategy (WRAPS) Project – Big Hill Creek/ Big Hill Lake Watershed Assessment. Final Report. KDHE Project No. 2006-0073. Kansas Dept. of Health and Environment, Bureau of Water. Topeka, KS.
16. Wilson, B.N., **A.Y. Sheshukov,** and A. Mendez (2008) Design Tool for Controlling Runoff and Sediment from Highway Construction, *Minnesota Department of Transportation, Report MN/RC-2008-35*, 109 p.
17. Wilson, B.N., **A.Y. Sheshukov,** and R. Pulley (2006) Erosion risk assessment tool for construction sites, *Minnesota Department of Transportation, Report MN/RC-2006-27*, 72 p.
18. Nieber, J., **A.Y. Sheshukov**, R. Dautov, and A. Egorov (2002) Non-equilibrium Model for Gravity-Driven Fingering in Water Repellent Soils: Formulation and 2-D Simulations, *U.S. Army High Performance Computing Research Center Tech. Report 2002-131*, 15 p.
19. Dautov, R., A. Egorov, J. Nieber, and **A.Y. Sheshukov** (2002) Simulation of two-dimensional gravity-driven unstable flow, *U.S. Army High Performance Computing Research Center Tech. Report 2002-102*, 8 p.
20. Egorov, A., R. Dautov, J. Nieber, and **A.Y. Sheshukov** (2001) Stability analysis of traveling wave solution for gravity-driven flow, *U.S. Army High Performance Computing Research Center Tech. Report 2001-108*, 8 p
21. **Sheshukov, A.Y.**, and A.G. Egorov (2001) Numerical modeling for evolution of frozen barrier in porous media, *U.S. Army High Performance Computing Res. Center Tech. Report 2001-007*, 22 p.
22. Egorov, A.G., and **A.Y. Sheshukov** (1995) Freezing of porous media induced by aqueous solution flow, *VINITI Preprint 2513 B95*, Moscow, 35 p. (in Russian).

Presentations at Scientific Meetings

1. **Sheshukov, A.Y.**, C.B. Siebenmorgen, K.R. Douglas-Mankin, and B.N. Wilson (2011) A Methodology of Assessing Future Hydrologic and Water-quality Impacts Using Statistical Downscaling of Ensembles of Global Circulation Models, *2011 ASABE Annual International Meeting,* Louisville, KY
2. **Sheshukov, A.Y.**, S. Perkins, and K.R. Douglas-Mankin (2010) Evaluation of Sedimentation Sources in East-Central Kansas with SWAT, *2010 ASABE Annual International Meeting,* Pittsburgh, PA
3. **Sheshukov, A.Y.**, and K.R. Douglas-Mankin (2010) Climate Change and Watershed Assessment within the WRAPS Program in Kansas, *2010 USDA Land Grant & Sea Grant National Water Conf.*
4. Siebenmorgen, C.B., **A.Y. Sheshukov**, and K.R. Douglas-Mankin (2010) Assessment of Impacts of Future Climate Change Scenarios on Hydrologic Regimes in One Northeast Kansas Watershed, *27th Annual "Water and the Future of Kansas" Conference*, Topeka, KS
5. **Sheshukov, A.Y.**, K.R. Douglas-Mankin, J. Roe, H. George, and P. Daggupati (2010) Rapid Assessment of Cost-Effectiveness of Unconfined Livestock BMP Bids, *2010 USDA Land Grant & Sea Grant National Water Conference*, Hilton Head, NC
6. Daggupati P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, and P.L. Barnes (2010) Monitoring and Estimating Ephemeral Gully Erosion using Field Measurements and GIS, *2010 USDA Land Grant & Sea Grant National Water Conference*, Hilton Head, NC

7. Daggupati P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, P.L. Barnes, D.L. Devlin, and R. Graber (2010) Field Scale Targeting of Sediment Yields using ArcSWAT in Black Kettle Creek Watershed, *2010 USDA Land Grant & Sea Grant National Water Conference*, Hilton Head, NC
8. **Sheshukov, A.Y.**, K.R. Douglas-Mankin, and B.N. Wilson (2009) Watershed Restoration and Protection under Changing Climate Conditions in Kansas, *AGU Fall Meeting, San Francisco, CA*
9. Dautov, R.Z., Egorov, A.G., Nieber, J.L., and **A.Y. Sheshukov** (2004) Modeling conditional stability of gravity-driven unsaturated infiltrating flows using a non-equilibrium capillary pressure-saturation relation. *Eos Trans. AGU*, 85 (47), Fall Meeting Suppl., Abstract H33B-0469.
10. Nieber. J., Dautov, R., Egorov, A., and **A.Y. Sheshukov** (2003) Dynamic capillary pressure mechanism for instability in gravity-driven flows; Overview of progress and quantification of model parameters. *Eos Trans. AGU*, 84 (46), Fall Meeting Suppl., Abstract H22J-02.
11. Nieber. J., Dautov, R., Egorov, A., and **A.Y. Sheshukov** (2003) Dynamic capillary pressure mechanism for instability in gravity-driven flows; Overview of progress and quantification of model parameters. *European Science Foundation (ESF) Exploratory Workshop*, Delft University of Technology, The Netherlands.
12. **Sheshukov, A.Y.**, Nieber, J.L., Egorov, A.G., Grant, S.A., and I.K. Iskandar (2001) Numerical and self-similar solutions for freezing of non-heaving porous media. *Eos Trans. AGU*, 82 (47), Fall Meeting Suppl., Abstract H22B-0360, 2001.
13. **Sheshukov, A.Y.**, Egorov, A. (2001) Freezing of liquid flow by a chain of freeze pipes. *Sixth SIAM Conference on Mathematical and Computation Issues in the Geosciences*, 2001.
14. **Sheshukov, A.Y.** (2001) Freezing of non-heaving porous media, *Invited Presentation in Department of Atmospheric Sciences, University of North Dakota, Grand Forks, ND*
15. **Sheshukov, A.Y.**, Nieber, J.L., Grant, S.A., and Iskandar, I.K. (2000) Thermally driven liquid and water vapor transport in unsaturated porous media: Mathematical formulation and numerical application. *Eos Trans. AGU*, 81(48), Fall Meeting Suppl., Abstract H12A-06, 2000.
16. **Sheshukov, A.Y.** (1999) Formation of ice-formed barrier induced by solute flow in ground. *Environmental Mathematical Modeling and Numerical Analysis International Conference*, Rostov-on-Don, Russia, 1999.

Extension and Outreach Presentations

1. **Sheshukov, A.Y.**, Daggupati P., and K.R. Douglas-Mankin (2011) Field level targeting using SWAT: mapping output from HRUs to field and assessing limitations of GIS input data, *Heartland Regional Water Coordination Initiative webcast.*
2. K.R. Douglas-Mankin, **A.Y. Sheshukov**, and C.B. Siebenmorgen (2010) Climate Change Impacts on Watersheds in Kansas, *Invited presentation,* KDHE, Topeka, KS
3. Daggupati, P., K.R. Douglas-Mankin, **A.Y. Sheshukov**, P.L. Barnes, and D.L. Devlin (2010) Targeting Agricultural Fields and BMP Implementation using ArcSWAT in Black Kettle Creek Watershed in South Central Kansas, *Heartland Regional Water Coordination Initiative webcast.*
4. **Sheshukov, A.Y.**, S. Perkins, and K.R. Douglas-Mankin (2009) Calibration Study of John Redmond Watershed, Kansas Water Office*, Topeka, KS*
5. Roe, J. and **A.Y. Sheshukov** (2009) Using a BMP Auction for Targeting in Kansas, *Heartland Regional Cost Effectiveness of BMPs and CRP Conversion to Cropland Workshop*, June 9-11, 2009
6. **Sheshukov, A.Y.** (2009) Marais de Cygnes Basin Targeted Watershed Grant Management Committee Meeting, KDHE and EPA Region 7, Adrian, MO (4 presentations)
7. **Sheshukov, A.Y.** (2009) Grand Lake Watershed Planning Committee, KDHE and EPA Regions 6, 7, Joplin, MO
8. **Sheshukov, A.Y.** (2008) Watershed Modeling in Kansas, *Invited Presentation at Kansas Environmental Leadership Program*, Hutchinson, KS
9. **Sheshukov, A.Y.** (2008-2010) Tuttle Creek WRAPS SLT Meeting, Marysville, KS (2 presentations)

10. **Sheshukov, A.Y.** (2008-2010) Milford Lake WRAPS SLT Meeting, Belleville, KS and Clay Center, KS (4 presentations)
11. **Sheshukov, A.Y.** (2010-2011) Delaware WRAPS SLT Meeting, Sabetha, KS (1 presentation)
12. **Sheshukov, A.Y.** (2008-2010) Upper Neosho WRAPS SLT Meeting, Iola, KS (3 presentations)
13. **Sheshukov, A.Y.** (2008-2010) Middle Neosho WRAPS SLT Meeting, Parsons, KS (3 presentations)
14. **Sheshukov, A.Y.** (2008-2010) Neosho Headwaters WRAPS SLT Meeting, Emporia, KS (3 presentations)
15. **Sheshukov, A.Y.** (2008-2010) Cottonwood WRAPS SLT Meeting, Marion, KS and Cottonwood Falls, KS (4 presentations)
16. **Sheshukov, A.Y.** (2008-2010) Toronto Lake WRAPS SLT Meeting, Toronto, KS (3 presentations)

Invited Research Presentations

1. Nieber, J.L, and **A.Y. Sheshukov** (2005) Various solutions for freezing of porous media, *Invited Presentation at Saint Anthony Falls Laboratory, University of Minnesota, Minneapolis, MN*
2. **Sheshukov, A.Y.** (2002) Numerical and self-similar solutions for freezing of non-heaving porous media, *Invited Presentation at the U.S. Army Cold Regions Research Engineering Laboratory, Hanover, NH*
3. Nieber, J.L., and **Sheshukov, A.Y.** (2002) Gravity-driven flow: Stability analysis and 2-D simulations, *Invited Presentation at Environmental Engineering Department, Cornell University, NY*
4. **Sheshukov, A.Y.** (2000) Coupled heat, water, and solute transport in saturated and unsaturated porous media with phase change, *Invited Presentation at U.S. Army Cold Regions Research Engineering Laboratory, Hanover, NH*