

# Lele Shu

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PhD of Water Resources Engineering  
Minor: Computational Science

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**About Me** I am a postdoctoral researcher in Department of Land, Air and Water Resources, University of California, Davis. My research interest is in computational hydrologic model, hydrologic data mining, and integrated Coupled Nature-Human System modeling.

## Education

- 2012 - 2017, Pennsylvania State University (University Park, Pennsylvania, USA). PhD in Water Resource Engineering, Minor in Computational Science  
*Thesis: Impacts of urbanization and climate change on the hydrological cycle: a study in modern and ancient land use change*
- 2006 - 2009, University of Chinese Academy of Sciences (Lanzhou, China). M.S. in Remote Sensing
- 2001 - 2005, Lanzhou University (Lanzhou, China). B.S in Geography Information System

## Work Experiences

2017 - Present                      Postdoctoral Researcher                      University of California, Davis (Davis, CA)

*Hydrologic modeling of the Central Valley in California*

*PIHM v4.0 (in C++). Parallel computing, lake modeling, calibration, independent river network, new data structure, bug fixed.*

*R package (PIHMgisR), for GIS data process, sensitivity and hydrologic analysis. (<https://github.com/happynotes/PIHMgisR>).*

2012 - 2017                      Research Assistant                      Pennsylvania State University (University Park, PA)

*Development of Penn State Integrated Hydrologic Model (PIHM)*

*Development of Cellular Automation Landuse Change Model (CALUC)*

*Hydrologic analysis tool (R) –Read, write, parameterize, analysis(time series, spatial and uncertainty analysis) and visualize (plot, 3D/3D and animation).*

*Development of hydrologic data process tools (R) –Automatically download data from national data server and convert the data in GRIB, HDF, NetCDF format to other Time-Series format.*

*Development of HydroTerre Conversion Tool (Java) –Convert the spatial and meteorological data from HydroTerre Data Server*

2009 - 2010                      Invited Lecturer                      Lanzhou Res. and Env. Tech College (Lanzhou, China)

## Conferences

2018    AGU, Washington, DC, USA

2018    California Water & Environmental Modeling Forum, Sacramento, California, USA

2017    AGU, New Orleans, Louisiana, USA

2015    AGU, San Francisco, California, USA

2015    Penn State Graduate Exhibition, University Park, Pennsylvania, USA

2014    AGU, San Francisco, California, USA

2014    Global Lake Ecological Observatory Network (GLEON) 16, Orford, Quebec, Canada

2014    Green Infrastructure and Stormwater Management SAC Meeting

2013    AGU, San Francisco, California, USA

## **Publications**

- L. Shu, C. Duffy. Competitive Lotka-Volterra System Cellular Automata Land Use Change Model. (will be ready to submit 2019)
- L. Shu, C. Duffy. Comparison of the simulated spatial distributed water balances by landuse classes in Conestoga Watershed. (ready to submit)
- L. Shu, C. Duffy. Developing plausible scenarios for the competing impacts of landuse change and climatic change in the Conestoga Watershed: past, present and future. (ready to submit)
- L. Shu, C. Duffy. Reconstructing the role of landuse change on water yield at the Maya urban center Tikal, Guatemala [700-800 AD]. (ready to submit)
- X. Yu, Z. Xu, D. Moraetis, N. Nikolaidis, L. Shu, et al. Coupled surface-subsurface modeling of fresh submarine groundwater discharge of an island in the Mediterranean Sea. *Hydrology and Earth System Sciences* (submitted)
- X. Yu, A. Lamacova, L. Shu, C. Duffy, P. Krám, J. Hruška, T. White, K. Lin. (2019). Data rescue in manuscripts: a hydrologic modelling study example. *Hydrological Sciences Journal*
- N. Ward, L. Shu, et al. Integrating fast and slow processes is essential for simulating human-freshwater interactions. *Ambio* (2018)
- K.M. Cobourn, ... L. Shu, ... From concept to practice to policy: modeling coupled natural and human systems in lake catchments. *Ecosphere*, 8. 2018
- L. Shu, Z. Nan. A novel system for near real-time field observation based on Twitter- like services and GSM/SMS network. *Journal of Glaciology and Geocryology*[J], 32(5). 2010.
- Z. Nan, L. Shu, Y. Zhao, et al. Integrated modeling environment and a preliminary application on the Heihe river basin[J]. *SCIENCE CHINA E: Technological Sciences*. 2011, 54(8): 2145-2156
- K. Feng, Z. Nan, Y. Zhao, L. Shu. Prototype Development for an Integrated Modeling Environment Based on Plugins. *Remote Sensing Technology and Application*[J]. 23(5). 2008.

## **Research Projects**

- 2018 Model Integration through Knowledge-Rich Data and Process Composition
- 2017 An Integrated Evaluation of the Simulated Hydroclimate System of the Continental US
- 2017 Advanced Statistical-Dynamical Downscaling Methods and Products for California Electrical System Climate Planning
- 2015 CNH-L: Linking Landuse Decision Making, Water Quality, and Lake Associations to Understand Human-Natural Feedbacks in Lake Catchments
- 2013 Land, Water, and Territory: A 3,000-Year Study of Niche Construction and Cultural Evolution in the Tikal National Park, Guatemala
- 2012 NSF Hydrologic and Water Quality Modeling for Green Infrastructure
- 2008 Simultaneous Remote Sensing and Ground-based Experiment in the Heihe River Basin: Scientific Objectives and Experiment Design
- 2008 Heihe Watershed Allied Telemetry Experimental Research (HiWATER)
- 2006 Land and Water Resources in Heihe River Basin Decision Support System for Sustainable Development Based on Scientific Models and Three-dimensional Gaming Experience
- 2006 GIS-based Hydrology and Water Resources Integrated Modeling Environment Research in Heihe River Basin

## **Skills**

Programming: ○ C/C++ ○ R ○ Java ○ Python ○ Shell ○ Matlab/Octave/SciLab ○ Fortran ○ Qt

Professional software: ○ PIHM/PIHMgis ○ ArcGIS/GRASS GIS/QGIS ○ SWAT ○ HYDRUS ○ HEC-RAS ○ PAWS/PRISM

## **Research Interests**

Development of distributed hydrologic model with numeric methods

Data mining and statistical downscaling modeling in hydrology

Hydrologic impact from landuse and climate change

Green infrastructure and stormwater management

High-performance/parallel computing in hydrology

Coupled Nature-Human watershed modeling

## **Courses Prepared To Teach**

Numerical methods in geosciences

Geographic Information System

Data Mining in R

Data structure and algorithm

Advance C/C++ programming