

# LI HUANG

Research Scientist | Tulane University

*PhD in Hydrogeology, University of Alabama*

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## RESEARCH INTERESTS

Interdisciplinary interests in hydrologic science, water resources management and sustainability:

- Groundwater flow and solute transport modeling
- Field, laboratory, modeling and theoretical studies of groundwater-surface water interactions
- Integrated modeling for sustainable water resource management at watershed scales
- Integrative study of ecohydrology and hydrogeology in arid and semi-arid environments
- Decision-making under uncertainty using process-based and data-driven models

## EDUCATION

Ph.D., Hydrogeology, University of Alabama, Tuscaloosa, U.S.A., 2016

M.S., Ecological Geology, Lomonosov Moscow State University, Moscow, Russia, 2007

B.S., Environmental Engineering, China University of Geosciences, Wuhan, China, 2004

## PROFESSIONAL EXPERIENCE

Associate Research Professional, Arizona State University, Tempe, U.S.A., Nov 2021-present

Senior Global Futures Scientist, Julie Ann Wrigley Global Futures Laboratory, Aug 2021-present

Postdoc Research Associate, Arizona State University, Tempe, U.S.A., May 2017- Nov 2021

Teaching & Research Assistant, University of Alabama, Tuscaloosa, U.S.A., 2009-2014

Environmental specialist and Project manager, Beijing Water International Ltd., China., 2008-2009

Assistant Research Fellow, Peking University, Beijing, China, 2007-2009

Research Assistant, Georisk, Russian Academy of Sciences, Russia, 2006

## TEACHING EXPERIENCE

Lab Instructor, Laboratory sections of Geo 101- The Dynamic Earth, University of Alabama, 2009-2014

Instructor, Using Fiber-optic Distributed Temperature Sensing to identify Groundwater-Surface water interactions, Peking University, 2011

Instructor, Applied Groundwater Flow and Transport Modeling, Beijing Water International Ltd. & China University of Geosciences, Beijing, 2008-2009

## AWARDS & HONORS

Outstanding Research by a Doctoral Student Award, University of Alabama, 2014

Philip E. and Bunnie LaMoreaux International Student Award, University of Alabama, 2012

Wallace C. Johnson Geological Sciences Endowed Fund, University of Alabama, 2011-2014

W. Gary Hooks Endowed Geology Fund, University of Alabama, 2011-2012

Outstanding Thesis Award, China University of Geosciences, 2004

Golden Spike Scholarship, China University of Geosciences, 2003

Dafo Li Scholarship, China University of Geosciences, 2002

## PROFESSIONAL AFFILIATIONS

Geological Society of America Member since 2013

American Association of Petroleum Geologists Member since 2011

American Geophysical Union Member since 2006

Minister of Students' Press Agency Editor in chief 2002-2003

Dabie Shan Edirof in chief 2003

## RELEVANT SKILLS

Languages: Chinese-Native, English-Proficient, Russian-Proficient

Models, Softwares & Coding: MODFLOW, MT3D, SEAWAT, PEST, GSFLOW, GMS; ArcGIS, MapGIS, Grapher, Surfer, Global Mapper; Matlab, Fortran, Python, C++; Adobe Illustrator/Photoshop, AutoCAD, CorelDraw, Origin, et al.

## JOURNAL PUBLICATIONS

1. Huang, L., Werth, S., Glen Low, Stampoulis, D. & Sabo, J. Groundwater dynamics in arid regions revealed by integrated flow model and satellite data. Submitted to *Water Resour Res* (2021).
2. Huang, L., Dimova, N., Tick Geoffrey, Ellis, J. & Zheng, C. Nitrate loadings via submarine groundwater discharge to the Gulf of Mexico. In submission for *Journal of Hydrology*.
3. Huang, L., Zheng, C. Decision support with Bayesian network and integrated groundwater-surface water flow modeling. In submission for *Water Resources Research*.
4. Huang, L., Zheng, C., Liu, J. and Xiao, H. (2012) Application of distributed temperature sensing to study groundwater-surface water interactions in the Heihe River Basin. *Hydrogeology and Engineering Geology* 39(2), 1-6.

## CONFERENCE PRESENTATIONS & TALKS

5. Huang, L., T. Ma, and Q. Guo. Groundwater vulnerability assessment in shallow aquifer of Taiyuan City using GIS-based DRASTIC model. in *The Sixth Water Forum of China*. 2008.
6. Huang, L. and V.T. Trofimov. Ecogeological risk assessment of Southern Sakhalin island, Russia. in *The Sixteenth International Scientific Conference Lomonosov* 2009.
7. Huang, L., et al. Identifying groundwater-surface water interactions in the middle reach of the Heihe River using a distributed temperature sensor. in *American Geophysical Union (AGU) Fall Meeting*. 2011.
8. Huang, L. and C. Zheng. The Impact of water resources exploration on groundwater-surface water interactions under climate change. in *American Geophysical Union (AGU) Fall Meeting*. 2012.
9. Huang, L., et al. Nitrate loadings via submarine groundwater discharge to the gulf of Mexico: a case study from the Alabama coast. in *Ocean Sciences Meeting*. 2014.
10. Huang, L., *Integrated modeling and management of groundwater and surface water, Zhangye Basin, northwest China*. 2016.
11. Huang, L. and J. Sabo, *Characterizing the sensitivity of groundwater storage to climate variation in the Indus Basin*. *American Geophysical Union (AGU) Fall Meeting*, 2017: p. H12D-05.
12. Huang, L., J. Sabo, and G. Low, *Integrated groundwater-surface water modeling for the Indus Basin: Basin Assessment Scenario Intervention Tool (BASIT)*. U.S. Department of State, Washington D.C., U.S.A., 2018.
13. Huang, L., et al., *Basin assessment scenario intervention tool: Integrated groundwater surface water modeling and management for the Indus Basin*. *American Geophysical Union (AGU) Fall Meeting*, 2018: p. H23J-2046.
14. Huang, L. and J. Sabo, *Assess sustainability of water resources in the Indus River Basin using integrated groundwater surface-water model*. *AGU Chapman Conference*, 2019.
15. Huang, L., et al., *Assessing groundwater recharge in arid and semiarid regions using integrated modeling and remote sensing*. *American Geophysical Union (AGU) Fall Meeting*, 2019: p. H23J-2018.
16. Huang, L., Sabo, J. & Low, G. *Evaluating the feasibility and efficiency of managed aquifer recharge strategy using simulation and optimization approaches*. *American Geophysical Union (AGU) Fall Meeting*, H163-0010 (2020).
17. Huang, L., and J. Sabo (2021), *A Hybrid process-guided machine learning approach for estimating groundwater dynamics*, *American Geophysical Union (AGU) Fall Meeting*.

## REPRESENTATIVE RESEARCH EXPERIENCE

*Arizona State University, Postdoctoral Research Associate*

- **Texas Conjunctive Ground Water Use Decision Support Tool, Texas, US**—Develop a science-based decision support tool to evaluate potential conjunctive surface water and ground water use solutions to environmental flow, reliability, and growth supply objectives. Integrate an inventory of landowners with hydrological models of instream flows to identify scenarios to generate the desired flow amount. Assess impacts of interventions redirecting existing water flows to determine how to increase available flows and storage during low flow events.
- **Decisin support tools for water management in Indus Basin, South Asia**—Develop a toolset that can be used by policy makers and stakeholders to assess the current watershed health in the Indus Basin and make tailored context based interventions for water management purposes. The toolset is composed of integrated surface-ground water modeling, watershed health assessments, scenario generating and projections, intervention recommendation and analyses.

*University of Alabama, Research Assistant*

- **Integrated modeling of the water-ecosystem-economy system for Heihe Basin, China**—Identified groundwater-surface water interactions zones using fiber-optic distributed temperature sensing. Constructed 3D geological, hydrostratigraphy models, and groundwater flow models to represent dynamic pathways, recharge distributions, water levels and budgets. Constructed integrated groundwater-surface water flow models to study regional groundwater-surface water interactions, and quantified the impact of climate change on water fluxes and storage. Evaluated the impact of large water diversion projects to water cycle and eco-hydrological system, and developed optimal water allocation plan.
- **Assessments of Nitrate loadings to the Gulf of Mexico Gulf Shores, USA**—Determined dominant groundwater flow and transport pathway to the Gulf of Mexico. Estimated groundwater discharge rates and nitrate fluxes to the ocean using groundwater flow and transport models. Projected future nutrients delivered to the coastal water under different groundwater extraction plans and agriculture irrigation scenarios.

*Beijing Water International Ltd., Environmental specialist/Project manager*

- **Geological/hydrogeological investigation at a potential mineral water bottling facility for DANONE Asia R&D. Guangzhou, China**—Provided groundwater consulting services for the identification and development of spring water sources. Developed long-term monitoring plans. Determined the spring recharge zone and potential production rates by conducting site investigation, characterization and modeling.
- **Groundwater impact assessment at a coal-based synthetic natural gas factory for Inner Mongolia Hui Neng Group. Inner Mongolia, China**—Conducted assessment of groundwater flow and quality, including site investigations, simulation of contaminant transport, design of construction pollution prevention plans.
- **Strategic groundwater resource evaluation for the coal mining plan of Fukang City. Xinjiang, China**—Collected, interpreted, analyzed various types of field data and wrote technical Report.
- **Groundwater impact assessment at the Guangxi hazardous material landfill for Shenzhou Environment Group. Guangxi, China**—Collected, interpreted, analyzed various types of field data and wrote technical reports.

*Peking University, Beijing, China, Assistant Research Fellow*

- **Hydrogeological support for understanding hydrologic processes and water quality evolution in the North China Plain. North China Plain, China**—Reviewed historic water table and water chemistry data, conducted hydrogeological field investigations, constructed regional geological-hydrogeological database in the ArcGIS system to support researchers in PKU water center.

*Lomonosov Moscow State University, Moscow, Russia, MS Student*

- **Eco-geological risk assessment of Southern Sakhalin Island, Russia**—Identified key parameters to risk assessment, evaluated and mapped zonation of regional eco-geological resources, geodynamic, geochemical, geophysical functions. Constructed an eco-geological risk assessment and an environmental impact assessment, developed a regional eco-geological risk assessment map of Sakhalin Island.

*China University of Geosciences, Wuhan, China, Student*

- **Assessment of groundwater vulnerability in Taiyuan Basin, China** — Collected water samples from wells across the Taiyuan Basin for model validation. Digitized and analyze environmental parameters using the GIS system. Used a DRASTIC model to evaluate groundwater vulnerability of shallow aquifers.