

# JAY CHOI

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Hydrogeologist

**EDUCATION**  
**PhD** Hydrology, 1998, University of Arizona, Tucson  
**MS** Geology, 1989, Shimane National University, Matsue, Japan  
**BS** Geology, 1986, Yonsei University, Seoul, Korea

**LANGUAGES** Korean, Japanese

**PROFESSIONAL HISTORY**  
**U.S. Geological Survey**, Reston VA  
Senior Research Associate, 2010-present  
**S.S. Papadopoulos & Associates, Inc.**, Bethesda, Maryland  
Project Hydrogeologist, 2001-2010  
**U.S. Geological Survey**, Reston VA  
Postdoctoral Fellow, 1998-2001  
**University of Arizona**, Department of Hydrology and Water Resources, Tucson  
Research Assistant, 1994-1998  
**Shimane National University**, Department of Geology, Matsue, Japan  
Research Assistant, 1987-1989

**SUMMARY OF QUALIFICATIONS**  
My expertise is hydrologic modeling and field investigation for contaminant transport processes, especially in coupled groundwater and surface-water systems. My experience has involved quantifying the interactions between groundwater and surface water in streams and wetlands using field-tracer studies and the application of numerical models with statistical optimization and statistical sensitivity analysis of transport models, the development and modification of surface-water flow model for wetland system, and the management and development of a hydrologic and biogeochemical database.

**AWARDS & HONORS**  
**Traineeship in Environmental Science**, NIEHS Superfund Hazardous Waste Research Program, 1995-1998

**Japanese Government Scholarship**, 1986-1989

**REPRESENTATIVE PROJECT EXPERIENCE**  
Projects that exemplify my experience are presented below.

- Roswell Basin, New Mexico – Extended, refined and recalibrated the groundwater flow model of the Roswell Basin groundwater system in New Mexico. In calibration processes, the general parameter estimation software, PEST-ASP (2001), was used to obtain the optimal set of parameters simulating the historical water levels and baseflow at the Pecos River. Using the recalibrated groundwater model, a quantitative framework for evaluating the impacts of alternative groundwater pumping strategies on stream flow in the Pecos River was provided. In addition, conducted an evaluation of the potential impacts associated with proposed augmentation pumping and irrigation water use retirement scenarios on streamflows and groundwater levels in the Roswell Basin. Graphical user interface was also provided to automate the modeling procedure, such as pre- and post-processing the model results from the groundwater flow model.
- Interstate Water Compact - Republican River Basin- In November 1999, the U.S. Supreme Court appointed a Special Master to oversee resolution of a dispute regarding allocation of water from the Republican River and allegations

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## REPRESENTATIVE PROJECT EXPERIENCE — *continued*

that Nebraska had violated the Republican River Compact. The Compact, signed in 1943 by the three basin States of Kansas, Colorado and Nebraska, allocates the water supply of the Republican River, with the total allocation given to each State derived from listed tributaries, and for Nebraska and Kansas, from the main stem of the Republican River. SSP&A was retained by the State of Kansas to provide technical support in quantifying the nature and magnitude of streamflow accretions and depletions from the ground water system in the Republican River Basin.

- Everglades National Park, Florida – Developed a diffusive surface-water flow model for describing transport processes in coupled groundwater/surface-water systems in the Everglades National Park, Florida. Conducted field investigation in Florida Everglades to collect and interpret hydrologic data for quantifying surface-water/groundwater interaction. Supervised U.S. Geological Survey junior scientists working on the research of transport modeling.
- Pinal Creek, Arizona – Conducted and developed numerical model to simulate transport processes of natural contaminants in a coupled surface/subsurface hydrologic system (especially for hyporheic exchange), planned and managed field investigation to quantify the interaction between surface water and groundwater by using tracer injection tests. Applied statistical sensitivity analysis to assist with numerical modeling approach.
- Polar Research at Summit, Greenland – Conducted experimental work for geochemical analysis and applied numerical models to describe transport and deposition processes in snow. Planned and carried out gas partitioning experiments.
- Maizuru/Akiyoshi-Nishiki Terranes, Southwest Japan – Conducted field survey for geological mapping to investigate sedimentation processes in alluvial basin, performed microscopic analysis of mineral composition.

## PROFESSIONAL SOCIETIES

American Geophysical Union  
Geological Society of Korea  
Geological Society of Japan

## PUBLICATIONS

- Harvey, J.W., S.L. Krupa, C. Gefvert, R.H. Mooney, J. Choi, S.A. King, and J.B. Giddings. 2002. *Interactions between Surface Water and Groundwater and Effects on Mercury Transport in the North-Central Everglades*. U.S. Geological Survey. In cooperation with the South Florida Water Management District. Water-Resources Investigations Report 02-4050. 82.
- Choi, J., M.H. Conklin, R.C. Bales, and R.A. Sommerfeld. 2000. Processes Controlling SO<sub>2</sub> Uptake in Snowpacks: *Atmospheric Environment*. 34, no. 5: 793-801.
- Choi, J., and J.W. Harvey. 2000. Quantifying Time-Varying Groundwater Discharge and Recharge in Wetlands: A Comparison of Methods in the Florida Everglades: *Wetlands*. 20, no. 3: 500-511.
- Choi, J., J.W. Harvey, and M.H. Conklin. 2000. Characterizing Multiple Timescales of Stream and Shallow Groundwater Interaction that Affect Solute Fate and

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## PUBLICATIONS

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- Transport in Stream: *Water Resources Research*. 36, no. 6: 1511-1518.
- Harvey, J.W., S.L. Krupa, C.J. Gefvert, J. Choi, R.H. Mooney, and J.B. Giddings. 2000. *Interaction Between Groundwater and Surface Water in the Northern Everglades and the Relation to Water Budgets and Mercury Cycling: Study Methods and Appendixes*. U.S. Geological Survey. Open-File Report 00-168. 411.
- Choi, J., J.W. Harvey, and M.H. Conklin. 1999. Use of Multi-Parametric Sensitivity Analysis to Determine Relative Importance of Factors Influencing Natural Attenuation of Mining Contaminants. In *U.S. Geological Survey Toxic Substances Hydrology Program – Proceedings of the Technical Meeting, Charleston, South Carolina, March 8-12, 1999*. Morganwalp, D.W., and H.T. Buxton, editors. Contamination from Hardrock Mining. Vol. 1 of 3. U.S. Geological Survey Water-Resources Investigations Report 99-4018A. 185-191.
- Choi, J., S.M. Hulseapple, M.H. Conklin, and J.W. Harvey. 1998. Modeling CO<sub>2</sub> Degassing and pH in a Stream-Aquifer System: *Journal of Hydrology*. 209: 297-310.
- Bales, R.C., and J. Choi. 1997. Conceptual Framework for Interpretation of Exchange Processes. In *Processes of Chemical Exchange between Polar Snow and Atmosphere*. Wolff, E., and R. Bales, editors. NATO ASI Series 1. Springer-Verlag. 319-338.
- Choi, J., S.M. Hulseapple, M.H. Conklin, and J.W. Harvey. 1997. Approach to Simulate the Spatial Variation in pH of a Stream Contaminated by Heavy Metals. (abstract). American Society of Limnology and Oceanography Annual Spring Meeting, February 10-14, Santa Fe, New Mexico.
- Choi, J., T. Tokuoka, and K. Yu. 1993. Late Paleozoic - Early Mesozoic Sandstone Petrology of the Maizuru and Akiyoshi - Nishiki Terranes in Southwest Japan: *Journal of Geological Society of Korea*. 29, no. 2: 188-198.
- Choi, J., K. Yu, and T. Tokuoka. 1991. Significance of Volcanogenic Sediments in the Nogam Formation of the Pyeongan Group in Korea (South): *Journal of the Geological Society of Japan*. 97, no. 7: 557-559.