Curriculum Vitae

Xianwu Xue

Postdoctoral Fellow
School of Civil Engineering & Environmental Science (CEES)
120 David L. Boren Blvd., National Weather Center, Suite 4640
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EDUCATION

Ph.D. in Hydrology and Water Resources, College of Hydrology and Water Resources, *Hohai University, Nanjing, China*, 2007.3-2010.6
Dissertation: Study of Karstic Watershed Hydrological Model and Parameters Regionalization in Southwest China.

M.S. in Hydrology and Water Resources, College of Hydrology and Water Resources, *Hohai University, Nanjing, China*, 2004.9-2007.3
Dissertation: GIS-based Visualized Numerical Modeling System for Seawater Intrusion in Weihai City, Shandong Province, China.

B.S. in Hydrology and Water Resources Engineering, School of Environmental Science and Engineering, *Chang'an University, Xi'an, China*, 2000.9-2004.7
Dissertation: Automatic Element Triangular Mesh Generation for Groundwater Modeling

RESEARCH INTERESTS

1) Distributed hydrological modeling and land surface modeling
2) Satellite remote sensing based hydrologic applications
3) Satellite based flood detection and monitoring
4) Global/Regional Climate Change and Hydrological Cycle
5) GIS Applications in Hydrology and Water Resources
6) Surface Water and Groundwater Interactions

PROFESSIONAL APPOINTMENTS

Postdoctoral Scholar, CEES. University of Oklahoma, Norman, OK, USA	07/2010~Present
Visiting Associate Research Fellow, State Key Laboratory of Severe Weather (LaSW), Chinese Academy of Meteorological Sciences, China	07/2013 ~Present
Instructor/Lecturer/Trainer of Workshop, Regional Centre For Mapping of Resources For Development (RCMRD), Nairobi, Kenya	04/02/2012 ~04/06/2012
Research Assistant, College of Hydrology and Water Resources. Hohai University, China	09/2004 ~06/2010

PROFESSIONAL SOCIETY AFFILIATIONS

AGU (American Geophysical Union) membership, 2011

International Association of Chinese Youth in Water Sciences (CYWater), 2011-Present

Toastmaster membership, 06/2014-Present

COURSES TAUGHT

2015	Guest Lecture	CEES-5843 Hydrology (Spring 2015)	Hands-on workshop for CREST model Training
2015	Guest Lecture	CEES-5843 Hydrology (Spring 2015)	How to use ArcGIS to prepare and visualize hydrological model simulation

SCIENTIFIC JOURNAL ARTICLE REVIEWER

-- Environmental Processes

-- Frontiers of Earth Science

-- Water Resources Management

-- International Journal of Climatology

-- International Journal of Remote Sensing (IJRS)

-- Advances in Meteorology

-- Journal of Hydrology

-- Remote Sensing

-- Climate

-- Water

-- Stochastic Environmental Research and Risk Assessment

-- 2015 International Conference on Water Resource and Environment (WRE2015)

HONORS & AWARDS

The Outstanding Graduate Award in 2010, awarded by Hohai University	2010
The Excellent Graduate Student Leader (as Class President and Commissary in Charge of Subsistence), awarded by Hohai University	2009
The Three Good Student, awarded by Chang'an University	2002
The Third Prize winner in "1st Program Designing Contest of Chang'an University", awarded by Chang'an University	2002
The Excellent Member of Campus Computer Association, awarded by Chang'an University	2002
The Second-Class Campus Scholarship of Three Good Student in Department, 2 times, awarded by Chang'an University	2001 & 2002
The Second Prize Winner in "2nd Mathematical Modeling Contest of Chang'an University", awarded by Chang'an University	2001

COMPUTER SKILLS

- **Hydrological Model:**
  CREST (Coupled Routing and Excess Storage)
  HYMOD, SIMHYD (wide-used in Australia)
  TOPMODEL, Xinanjiang Watershed Model
  DHSVM (Distributed Hydrological-Soil-Vegetation Model)
  VIC Model (Variable Infiltration Capacity Macroscale Hydrologic Model)
  Karst Daily/Monthly Hydrological Model (Lumped & Sub-basin Based)
  USGS Thornthwaite Model, WRF-Hydro, etc.
- **Groundwater Numerical Model:**
  MODFLOW-2000 & 2005, SUTRA (Saturated Unsaturated Transport)
  Visual MODFLOW, GMS, etc.
- **Meteorological Data Processing Tools:**
  WGRIB, WGRIB2, GrADS, NCL, etc.
- **Statistics Methods and Software:**
  R, Linear and nonlinear regression, Multivariate statistics
  SPSS, Excel, Geostatistical Analysis Extension of ArcGIS, etc.
- **Programming Skills and Languages:**
  FORTRAN, C#, Python, Visual Basic 6.0, Visual Basic .NET, C, C++
  Matlab, Linux/Unix Shell, HTML, PHP, Java Script, IDL, etc.
- **Graphics Software:**
  GRDAS, Excel, Origin, Visio, Photoshop, etc.
- **GIS Software:**
  ArcGIS Including Second-Development using ArcObjects/ArcEngine and C#/Visual Basic 6.0/.net, MapInfo, etc.
- **System:**
  Windows, Linux/Unix, (MAC) OS X

PUBLICATIONS

Journal Papers

J-28 **Xianwu Xue**, Yang Hong, Jonathan Gourley, Ke Zhang, Zhanming Wan, et al. 2015. Application of a novel cascading calibration approach to improve the accuracy of flash flood prediction, *Journal of Hydrology* (in preparation)

J-27 **Xianwu Xue**, Yang Hong, Ke Zhang, Jonathan Gourley, et al. 2015. A Long-Term Land Surface Hydrologic Fluxes and States Dataset for Red River Basin. *Journal of Hydrometeorology* (in preparation)

J-26 **Xianwu Xue**, Fanyou Kong, Yang Hong Ming Xue, Jian Zhang and Jonathan Gourley, Ke Zhang, et al. 2015. CAPS-HyDROS: Ensemble Streamflow Prediction by Coupling the CAPS Multi-Model Storm-Scale Ensemble Forecast with the HyDROS Distributed Hydrological CREST Model across CONUS. *Journal of Hydrology* (in preparation)

J-25 Sheng Chen, Z. Zhang, A. Behrangi, Y. Hong, J. Hu, A. Bao, A.S. Gebregiorgis, **Xianwu Xue**, 2015. Hydrologic Evaluation of the TRMM Multi-satellite Precipitation Analysis over Ganjiang Basin in Humid Southeastern China. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (IEEE J-STARS)*. (Minor Revision).

J-24 **Xianwu Xue**, Yang Hong, Ke Zhang, Jonathan Gourley, Wayne Kellogg, Renee A. McPherson, Zhanming Wan and Barney N. Austin. 2015. A New Multi-site Cascading Calibration Approach for Hydrological Models: A Case Study in the Red River Basin using the VIC Model. Journal of Hydrologic Engineering (Accepted on 06/26/2015): DOI: 10.1061/(ASCE)HE.1943-5584.0001282

J-23 Xianmeng Meng, Maosheng Yin, Libo Ning, Dengfeng Liu, **Xianwu Xue**. 2015. A threshold artificial neural network model for improving runoff prediction in a karst watershed. *Environmental Earth Sciences* (Online on 03 Jun 2015): DOI: http://dx.doi.org/10.1007/s12665-015-4562-9

J-22 Guoqiang Tang, Zhe Li, **Xianwu Xue**, Qingfang Hu, Bin Yong and Yang Hong, 2015. A study of substitutability of TRMM remote sensing precipitation for gauge-based observation in Ganjiang River basin. *Advances in Water Science*, 26 (3), 340-346. DOI: http://skxjz.nhri.cn/CN/10.14042/j.cnki.32.1309.2015.03.005

J-21 Hao Guo, Sheng Chen, Anming Bao, Jujun Hu, Abebe S. Gebregiorgis, **Xianwu Xue** and Xinhua Zhang, 2015. Inter-comparison of high-resolution satellite precipitation products over Central Asia. *Remote Sensing*, 7 (6), 7181-7211. DOI: http://dx.doi.org/10.3390/rs70607181

J-20 Carr, N., Kirstetter, P.E., Y. Hong, J.J. Gourley, M. Schwaller, W. Petersen, N.Y. Wang, R. Ferraro, **Xianwu Xue**, 2015. The influence of surface and precipitation characteristics on TRMM TMI rainfall retrieval uncertainty. *Journal of Hydrometeorology* (e-View). DOI: http://dx.doi.org/10.1175/JHM-D-14-0194.1

J-19 Yu Zhang, Yang Hong, Xuguang Wang, Jonathan J. Gourley, **Xianwu Xue**, Manabendra Saharia, Guangheng Ni, Gaili Wang, Yong Huang, Sheng Chen, and Guoqiang Tang, 2015:

Hydrometeorological Analysis and Remote Sensing of Extremes: Was the July 2012 Beijing Flood Event Detectable and Predictable by Global Satellite Observing and Global Weather Modeling Systems?. *Journal of Hydrometeorology*, 16, 381–395. DOI: http://dx.doi.org/10.1175/JHM-D-14-0048.1

J-18 **Xianwu Xue**, Yang Hong, Ashutosh S. Limaye, Jonathan J. Gourley, George J. Huffman, Sadiq Ibrahim Khan, Chhimi Dorji, Sheng Chen. 2013, Statistical and hydrological evaluation of TRMM-based Multi-satellite Precipitation Analysis over the Wangchu Basin of Bhutan: Are the latest satellite precipitation products 3B42V7 ready for use in ungauged basins? *Journal of Hydrology*, 499, 91-99. DOI: http://dx.doi.org/10.1016/j.jhydrol.2013.06.042

J-17 Sheng Chen, Yang Hong, Jonathan J. Gourley, George J. Huffman, Yudong Tian, Qing Cao, Bin Yong, Pierre-Emmanuel Kirstetter, Junjun Hu, Jill Hardy, Zhe Li, Sadiq I. Khan, **Xianwu Xue**, 2013. Evaluation of the successive V6 and V7 TRMM multisatellite precipitation analysis over the Continental United States. *Water Resources Research*, 49(12), 8174-8186. DOI: http://dx.doi.org/10.1002/2012WR012795

J-16 Sheng Chen, P. E. Kirstetter, Y. Hong, J. J. Gourley, Y. D. Tian, Y. C. Qi, Q. Cao, J. Zhang, K. Howard, Junjun Hu, and **Xianwu Xue**, 2013: Evaluation of Spatial Errors of Precipitation Rates and Types from TRMM Spaceborne Radar over the Southern CONUS. *Journal of Hydrometeorology*, 14, 1884–1896. DOI: http://dx.doi.org/10.1175/JHM-D-13-027.1

J-15 Xianmeng Meng, Hongchang Hu and **Xianwu Xue**, 2013. Influencing Factors Analysis and Assessment Model of Confined Aquifer Vulnerability in Leakage Area: A Case Study of Jining, China. *Journal of Natural Resources*, 28(9): 1615-1622. (Chinese Journal with English Abstract)

J-14 Xianmeng Meng, Bang Yang, and **Xianwu Xue**, 2012, Advancement in Research of Hydrological Processes Simulation for Karst Region and Future Challenges, *Advanced Materials Research*, vols 518 - 523, pp 4104-4110. DOI: http://dx.doi.org/10.4028/www.scientific.net/AMR.518-523.4104

J-13 Xi Chen, Yanfang Zhang, Xianwu Xue, Zhicai Zhang and Lingna Wei, 2012. Estimation of baseflow recession constants and effective hydraulic parameters in the karst basins of southwest China. *Hydrology Research*, 43(1-2): 102-112. DOI: http://dx.doi.org/10.2166/nh.2011.136

J-12 Minhua Ling, Xi Chen, Qinbo Cheng, **Xianwu Xue** and Nianxiu Qin, 2011. Couple Modeling between Surface Hydrology Process and Groundwater Dynamic Process and Its Application. *Journal of China Hydrology*, 31(6): 8-13. (Chinese Journal with English Abstract)

J-11 **Xianwu Xue**, Xi Chen, Nianxiu Qin, Xusheng Zhao, Peng Shi, 2011. Correlation analysis between low-flow recession coefficient and surface landform characteristics in karst basin. *Carsologica Sinica*, 30(1): 41-46. (Chinese Journal with English Abstract)

J-10 Zhicai Zhang, Xi Chen, Lingna Wei, **Xianwu Xue**, Nianxiu Qin and Qinbo Cheng, 2011. Effect of forest vegetation on soil moisture in sloping land with red soil. *Water Resources Protection*, 27(1): 15-19. (Chinese Journal with English abstract)

J-09 Nianxiu Qin, Xi Chen, **Xianwu Xue** and Chunfang Zeng, 2011. Effects of climate change on hydrology and water resources in Wujiang Basin. *Journal of Hohai University: Natural Sciences*. 39(6): 623-628. (Chinese Journal with English abstract)

J-08 Nianxiu Qin, Xi Chen, Guobin Fu, Jianqing Zhai and **Xianwu Xue**, 2010. Precipitation and temperature trends for the Southwest China: 1960-2007. *Hydrological Processes*, 24(25), 3733-3744. DOI: http://dx.doi.org/10.1002/hyp.7792

J-07 Nianxiu Qin, Xi Chen, **Xianwu Xue**, Minhua Ling and Zhicai Zhang, 2010. An applicability study of potential evapotranspiration models in Guizhou province. *Advances in Water Science*, 21(3): 357-363. (Chinese Journal with English abstract)

J-06 **Xianwu Xue**, Xi Chen, Zhicai Zhang and Lingna Wei, 2009. Effect of Karst Fracture on Saturated Subsurface Flow Confluence. *Water Resources and Power*, 27(6): 20-23, 82. (Chinese Journal with English Abstract)

J-05 **Xianwu Xue**, Xi Chen, Zhicai Zhang and Nianxiu Qin, 2009. Categorization of karst landform on the basis of landform factor eigenvalue. *Carsologica Sinica*, 28(2): 175-180. (Chinese Journal with English abstract)

J-04 Nianxiu Qin, Xi Chen, **Xianwu Xue** and Zhicai Zhang, 2009. Analysis of pan evaporation trend and its impact factors in Guizhou Province. *Journal of Lake Sciences*, 21(3): 434-440. (Chinese Journal with English abstract)

J-03 **Xianwu Xue**, Xi Chen, Lingna Wei, Yuxiang Qian, Yiming Lv, and Naibo Sun, 2007. Visualized Numeric Simulation System of Seawater Intrusion Based on GIS. *Ground Water*, 29(1), 35-39. (Chinese Journal with English Abstract)

J-02 **Xianwu Xue**, 2006. Modified Saturated-Unsaturated Transport Model. *Sciencepaper Online*, (http://www.paper.edu.cn). (Chinese Journal with English Abstract)

J-01 Lingna Wei, Xi Chen, Na Fu, and **Xianwu Xue**, 2006: Analysis of Seawater Intrusion Interface Movement by Using Potential Function Method. *Sciencepaper Online*, 129-134. (Chinese Journal with English Abstract)

Conference Presentations

PT-01 **Xianwu Xue**, Yang Hong, Jonathan Gourley and Xuguang Wang. Evaluation of Satellite-based Global Hydrologic Simulation using the Distributed CREST Model and Global Runoff Data Centre Archives. *International Workshop on Water-related Disaster Prediction and Prevention*. Nanjing, China, 2011 (Invited Talk)

PT-02 **Xianwu Xue**, Yang Hong, Jonathan Gourley and Xuguang Wang. Evaluation of Satellite-based Global Hydrologic Simulation using the Distributed CREST Model and Global Runoff Data Centre Archives, *2011 Fall AGU Meeting*, San Francisco, CA, U.S., Dec 5-9, 2011 (Poster)

PT-03 **Xianwu Xue**, Yang Hong and Jonathan Gourley. Evaluation of Satellite-based Global Hydrologic Simulation using Distributed CREST Model. *2nd International Symposium on Earth-Science Challenges*, 2011, Norman, Oklahoma, USA, September 14 – 16 (Poster)

PT-04 Yang Hong, Yu Zhang, **Xianwu Xue**, Xuguang Wang, Jonathan J. Gourley and Pierre-Emmanuel Kirstetter. A Global Hydrological Ensemble Forecasting System: Uncertainty Quantification and Data Assimilation. *2012 Fall AGU Meeting*, San Francisco, CA, U.S., Dec. 3-7, 2012. (Invited talk)

PT-05 Yang Hong, **Xianwu Xue**, Jonathan J Gourley, Robert F Adler. DFL-MaP: A Global Real-time Hydrological Modeling System for Drought-Flood-Landslide Monitoring and Prediction. *2012 Fall AGU Meeting*, San Francisco, CA, U.S., Dec. 3-7, 2012. (Invited talk)

PT-06 **Xianwu Xue**, Fanyou Kong, Yang Hong, Ming Xue, Jian Zhang and Jonathan Gourley, 2013: CAPS-HyDROS: Ensemble Streamflow Prediction by Coupled CAPS Multi-Model Storm-Scale Ensemble Forecast and HyDROS Distributed Hydrological CREST Model over CONUS. *2nd China-U.S. Symposium on Meteorology*, Qingdao, China, June 25-27, 2013. (Oral)

PT-07 Yu Zhang, Y. Hong, Huilin Gao, **Xianwu Xue** and J. J. Gourley. Multi-scale Evaluation of the Global Hydrological Modeling System forced by Real Time Multi-satellite Precipitation. *2013 Fall AGU Meeting*, San Francisco, CA, U.S., Dec 9-13, 2013.

PT-08 **Xianwu Xue**, Y. Hong, J. J. Gourley, R. F. Adler, and Y. Zhang. HydroXtreme-MaP: A Global Real-time Hydrological Modeling System for Flood and Drought Monitoring and Prediction. *AMS Annual Meeting*, Austin, TX, U.S., Jan 3-7, 2013. (Poster)

PT-09 **Xianwu Xue**, Fanyou Kong, Yang Hong, Ming Xue, Jian Zhang and Jonathan Gourley. CAPS-HyDROS: Ensemble Streamflow Prediction by Coupled CAPS Multi-Model Storm-Scale Ensemble Forecast and HyDROS Distributed Hydrological CREST Model over CONUS. *CYWater 2013 summer meeting - Hydrology frontiers & extension*, Beijing, China, August 3, 2013. (Oral)

PT-10 **Xianwu Xue**. How the CREST Model (Coupled Routing and Excess Storage) uses remote sensing data to do hydrologic modeling at global and regional scales. *Civil Engineering of Shandong Agricultural University*, Tai'an City, Shandong, China. June 28 2013. (Invited Talk)

PT-11 **Xianwu Xue**. Multi-scale Applications of Satellite Precipitation. *The 2nd CAS/THU Hydrology and Water Resource* Symposium, Beijing, China. January 10, 2014 (Oral)

PT-12 **Xianwu Xue**, Ke Zhang, Zhanming Wan, Zhen Hong, Yang Hong and Jonathan J. Gourley. Retrieval of Actual Evapotranspiration from Ground and Satellite Observations Over the Conterminous United States. *GIS Day – The University of Oklahoma* – Norman, OK November 13, 2014 (Poster)

Conference Proceedings

P-04 Yixin Wen, Yang Hong, P. Kirstetter, Qing Cao, J. J. Gourley, Jian Zhang, and Xianwu Xue, 2014: Systematical evaluation of VPR- Identification and Enhancement (VPR-IE) approach for different precipitation types. 92590C-92590C-92599.

P-03 Xianwu Xue, Xi Chen, Minhua Ling (2009). ArcEngine-based Assignment Method of Hydrological Parameters. in Proceedings of Chinese Water Forum No. 7 (Sustainable Management of Water Systems and Water Resources), Chinese Water Forum No. 7: Beijing, China WaterPower Press, 322-326. (Chinese Journal with English Abstract)

P-02 Xianwu Xue, Xi Chen and Hong He (2008). A Visualized Numerical Modeling System for SUTRA Based on ArcGIS Engine. in 2008 Proceedings of Information Technology and Environmental Systems Sciences, International Conference on Information Technology and Environmental Systems Sciences 2008: Jiaozuo; Vol. 2, pp 761-765.

P-01 Hong He, Xingnan Zhang and Xianwu Xue (2008). Water body extraction using MODIS data in the Yangtze River. in 2008 Proceedings of Information Technology and Environmental Systems Sciences, International Conference on Information Technology and Environmental Systems Sciences 2008: Jiaozuo; Vol. 2, pp 1232-1237.

Books or Book Chapters

BC-01 Yang Hong, Sheng Chen, **Xianwu Xue** and Gina Hodges. "Global Precipitation Estimation and Applications", book chapter for Ni-Bin Chang and Yang Hong (eds.), Multi-scale Hydrologic Remote Sensing: Prospects and Applications, Taylor & Francis, 2012, Publication Date: March 23, 2012, ISBN-10: 1439877459, ISBN-13: 978-1439877456

BC-02 Sadiq I. Khan, Ni-Bin Chang, Yang Hong, **Xianwu Xue**, Yu Zhang. "Remote Sensing Technologies for Multi-scale Hydrological Studies: Advances and Perspectives", Remote Sensing Handbook, Vol. III (Water Resources, Disasters, and Urban: Monitoring, Modeling, and Mapping), Taylor and Francis inc. (In press)

Technical Reports

Hong, Yang and **Xue, Xianwu**. 2011. NASA-OU CREST (v2.0) Distributed Hydrologic Model Software Package and User Manual

Xue, Xianwu, Hong, Yang and Ke Zhang. 2014. NASA-OU CREST (v2.1) Distributed Hydrologic Model Software Package and User Manual

RESEARCH PROJECTS & GRANTS

Research Proposals Assisted

- SERVIR-DEWS: A Flood and Landslide Disaster Early Warning System for Mesoamerica and the Himalaya Region
  Source of Support: NASA ROSES-2011

Amount, Period & Status: $ 374K (01/ 2013-12/2015), Not funded.

- Integrated Land-Space Multi-source Precipitation Retrieval, Fusion and its Applicability over the broader Tibetan Plateau
  Source of Support: National Natural Science Foundation of China
  Amount, Period & Status: ￥4M (~$666K) (01/2014-12/2017), Not Funded.

- Multi-Scale Hydrological Flash-Flood Simulation and Warning System Development in Typical Watershed in China
  Source of Support: State Key Laboratory of Severe Weather, Chinese Academy of Meteorological Sciences
  Amount, Period & Status: ￥500K (~$80K) (10/2013-03/2015), Funded.

- Urban flooding prediction and disaster prevention measures
  Source of Support: National Natural Science Foundation of China
  Amount, Period & Status: ￥3.6M (~$600K) (01/2015-12/2019), Not Funded.

- Integrated Land-Space Multi-source Precipitation and Total Water Storage Retrievals for Water Cycle Study over the Broader Tibetan Plateau
  Source of Support: National Natural Science Foundation of China
  Amount, Period & Status: ￥3.6M (~$0.6M) (01/2015-12/2018), Funded.

- China's Water and Food Security under Climate Extreme Impact: Risk Assessment and Resilience
  Source of Support: National Natural Science Foundation of China
  Amount, Period & Status: ￥2.2M (~$0.4M) (01/2015-12/2019), Funded.

Fulfilled or Contributed Projects

- NASA/Marshall Space Flight Center SERVIR Program: "Quantitative Assessment of Scenario-based Climate Change Impact on Water Availability and Hydrologic Flows in the Wangchu Basin of Bhutan", 06/2011-3/2012
- NASA/Marshall Space Flight Center SERVIR Program: "Implement High-resolution CREST Hydrologic Model for Africa and Central America using Satellite Remote Sensing Technology", 02/2011-3/2012 (Co-PI)
- NASA/Marshall Space Flight Center SERVIR Program: "Implement Distributed CREST Hydrological Model For Bhutan Country and Conduct Training Workshop for SERVIR Partners (KMD and ICMID/Bhutan)", 03/2012-08/2012
- Oklahoma Department of Transportation (OTC): "Decision Support System for Road Closures in Flash Flood Emergencies", 2011-2013
- DOI/USGS and South-Central Climate Science Center: "Impacts of Climate Change on Flows in the Red River Basin", 09/2013-09/2015
- National Key Fundamental Research Project, China (973): "Karst Hydrological Dynamics and Ecological Effect in Southwest China (China Fundamental Scientific Research",

Project Number: 2006CB403204, 2008.1-2010.6

- Weihai Hydrology Bureau: Weihai Prediction of Sea Water Intrusion and Management System for Groundwater Resources in Weihai City, 2005.5-2007.10

Developed Products

- Hydrological Model Development and Application
  a) Developed a grid-based Distributed Hydrological model (CREST) and implemented for the NASA SERVIR-Africa projects for the near-real time Flood Warning and Forecasting System) (used Fortran and Shell Scripts and GRADS)
  b) Developed Karstic hydrological model and applied in Southern China in my Ph.D. Study (used Visual Basic v6.0)
  c) Modified USGS-SUTRA model (2D or 3D saturated-unsaturated, variable-density ground-water flow with solute or energy transport) and applied in Weihai City, China for Seawater Intrusion Warning System and Water Management (used Fortran)
  d) Developed a Multi-site Cascading Calibration Method (used C# and/or Fortran) to Calibrate CREST model and Variable Infiltration Capacity Macroscale Hydrologic Model (VIC Model) to improve the model performance in all available gauge locations.
- Software Development, Visualization and Web-Development
  a) Developed a global and regional Hydrological Simulation and Flood and Drought monitoring demonstration System Using Google Earth (http://eos.ou.edu/, visualization including Global-Flood, Global-Drought, SERVIR-AFERICA, SERVIR-BHUTAN and Wangjiaba-CREST) (used Fortran, Python, GRADS, Shell Scripts, PHP and HTML)
  b) Developed ArcEngine based physically based distributed hydrology-soil-vegetation model (DHSVM) System (ArcDHSVM) (used Visual Basic v6.0, Visual C++ v6.0 and Fortran)
  c) Developed ArcEngine based Seawater Intrusion System Using USGS-SUTRA Model (ArcSUTRA) (Using Visual Basic v6.0, Visual C++ v6.0 and Fortran)
  d) Developed ArcEngine based Water Management System for Anyang City (Using C#, Visual Basic .NET, Visual C++ and Fortran)
  e) Developed Toolbox System for myself to deal with the data process, analysis, visualization Using Multi-threaded programming (Using C#, ArcEngine and Python)