

## **Nick Z. Fang, Ph.D., P.E.**

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### **Education**

- Ph.D. in Civil and Environmental Engineering  
Rice University
- M.S. in Chemical Engineering  
Lamar University
- B.S. in Environmental Engineering  
Zhejiang University

### **Research Areas**

Urban hydrology, urban flood analysis, flood warning and alert systems, flood control, water resources, water quality strategies, hydrologic and hydraulic modeling/design, stormwater management, pipeline systems, open channel flow analysis, inland flooding induced by severe storm surge, coastal resilience, 2-D and 3-D visualization of fluid modeling, remote sensing, UAV data collection, groundwater hydrology, contaminant transport mechanisms in groundwater, aquifer remediation strategies and modeling.

### **Research Statement**

Dr. Fang is an assistant professor in civil engineering at the University of Texas at Arlington. He obtained his Ph.D. degree in Civil and Environmental Engineering at Rice University in 2008. He has been working on surface water and groundwater problems for over seventeen years including floodplain studies, hydrologic/hydraulic modeling, reservoir operations and management, water infrastructure, water treatment, hydrodynamic simulation, storm water management modeling, and water quality assessment for a number of watersheds and municipalities in Texas, Florida, Connecticut, California, and Louisiana. Not only has he accomplished many projects in drainage modeling and design, but he has also actively worked in the area of hydrologic/hydraulic analysis for flood prediction and warning in real time. Dr. Fang has enhanced a radar-based flood warning system to achieve more accurate and timely flood forecasts. He recently developed advanced features for a real-time flood alert system for the Texas Medical Center (TMC) based on the use of NEXRAD radar data. This system is currently delivered real-time on a web site ([fas4.flood-alert.org](http://fas4.flood-alert.org)) that has been tested on major flood events in Houston. This system has been operational during the last 50 storm events and successfully provided precise and timely information to the TMC emergency center. The state-of-the-art flood warning system has been able to successfully reduce millions dollars of damage for local institutions and hospitals in the past 15 years. As a result of his work in the development of the advanced flood warning and control system for Houston and statewide model for Texas, Dr. Fang was funded by CASA, an NSF Engineering Research Center (ERC) to develop the next generation flood warning system by incorporating higher-resolution radar network and hydrologic/hydraulic prediction tools. His work is being expanded as a prototype to other flood-prone areas in the U.S. He had accomplished many projects for the United State Geological Survey (USGS), TxDOT, the Clear Lake City Water Authority (CLCWA), and the Cities of Grand Prairie, Carrollton and Sugar Land in the past. Before Dr. Fang joined the Civil Engineering Department at the University of Texas at Arlington, he worked as project manager and assistant to the director in the Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED) center at Rice University.

Dr. Fang has played key roles in the following development efforts and made significant contributions to the field of hydrologic/hydraulic modeling, drainage design, flood forecasting, flood alert, and remote sensing.

- In order to obtain reliable flood predictions to incorporate hurricane induced storm surges in Galveston Bay, Dr. Fang integrated storm surge model output with the revised hydraulic models within Geographic Information System (GIS) and NEXRAD radar data. This system is a powerful tool for predicting severe storm impact and will allow governmental agencies to make well-informed decisions on flood control, evacuation planning, and assist the allocation of funding for mitigation of flood problems caused by severe storm surge events.
- Dr. Fang has developed a predictive floodplain library by integrating various flood profiles for three major bayous of Houston to delineate floodplains and quantify water surface elevations. He ran both the hydrologic and the integrated hydraulic models to delineate floodplain maps under various spatial and temporal conditions associated with rainfall intensities. He also helped design a unique computing algorithm to link up with appropriate flood maps dynamically based on actual rainfall measurements for the storm in progress. This new feature enables emergency personnel to determine likely inundations based on future rainfall patterns and begin flood preparations with as much lead time as possible. This will help reduce economic losses by taking strategic measures early in a flood disaster.
- The traditional steady-state flood modeling method can cause up to several feet of error in elevation, which may result in huge economic and life losses during severe storm events, especially for areas with flat topographic conditions. To address this, Dr. Fang developed an unsteady-state model to depict dynamic changes of flow and stage hydrographs in magnitudes and timings, and is more realistic and precise in delineating floodplain maps than the traditional methods that Federal Emergency Management Agency (FEMA) uses. This unsteady-state modeling approach is a new contribution to federal flood control and management initiatives, and is the wave of the future.
- Dr. Fang leads research on the “MavAir” unmanned aerial vehicles (UAVs) at UTA to advance our capabilities for surveying terrain to help flood experts collect and assess complex data for commercial, environmental, energy, utilities, agricultural and urban planning. Due to many uncertainties in existing datasets that prevent critical questions from being answered in the fields of hydrology and hydraulics, Dr. Fang and his team believe that UAVs are the perfect fit to advance our research including collecting timely and ultra-high resolution data. [MavAir No. 1 \(see video\)](#) is an octocopter UAV system selected by Fang and his team to provide high payload capacity, long flight duration and stability, which supports several remote sensing applications, including LiDAR. Currently, his main research goal in UAVs for the SSPEED center is to collect, process and integrate all of these different pieces of information like terrain, vegetation, waterbodies, bridges, and flood inundation extension to a comprehensive and precise hydrologic/hydraulic model.

Besides his strong background in surface and groundwater hydrology and hydraulics, experience in environmental engineering, Dr. Fang also possesses in-depth knowledge and experiences of hydrologic, hydraulic, and groundwater packages such as HEC-HMS, HEC-RAS, GW-Vistas, XP-SWMM, Visual MODFLOW, and ArcGIS. Additionally, he has investigated and modeled numerous groundwater contaminated sites in Texas, Louisiana, Florida, and Connecticut.

## Experience

- **Assistant Professor, University of Texas at Arlington, TX.** (October 2013 – Present)
  - Perform research in urban water resources management, storm water management, water infrastructure, radar-based flood warning in real time, unmanned aerial vehicles (UAVs) application in water resources, drought prediction, urban sustainability design and planning, and Low Impact Development.
  - Conducting research in identification of urban flood impacts caused by land subsidence and sea level rise for the Houston-Galveston Region (NSF #1832065 - **\$180,000/PI** – 2018-2020)

- Performing water resources review and research, hydrology and hydraulic Studies of the Trinity River and Guadalupe River for the U.S. Army Corps of Engineers (**\$154,000/PI – 2017-2018/recurring for the following 4 years – up to \$770,000 as total**).
- Developing a Generalized Skew Update and Regional Study of Other Measures of Distribution Shape for Texas Flood Frequency Analyses (TXDOT 19-3) (**\$125,862/PI - 2018-2021**).
- Developing a Water Management and Planning Tool for the Trinity River Authority (**\$60,000/PI – Phase II/2019**).
- Performing research sponsored by the U.S. Department of Agriculture (USDA) through ALFA-IoT: Alliance For Smart Agriculture in the Internet of Things Era (**\$295,000/Co-PI (2018-2022)**).
- Developing an advanced flood warning system for the City of Carrollton (**\$78,530/PI – 2018-2019**).
- Developing an advanced flood warning system for the City of Grand Prairie – Phase II (**\$69,980/PI – 2018-2019**).
- Developed a Water Management and Planning Tool for the Trinity River Authority (**\$60,000/PI – 2018-2019**).
- Performed Dallas-Fort Worth Regional Assessment of Fair Housing for the City of Dallas and other cities (**\$918,930/Co-PI – 2016-2018**).
- Assessing the Impact of Air Pollution on Public Health along Transit Routes for Western Michigan University (**\$103,200/Co-PI – 2017-2018**).
- Developed an advanced flood warning system for the City of Grand Prairie – Phase I (**\$48,355/PI – 2016-2017**).
- Performed research on climate forecast-aided drought decision support for North Central Texas with funding support from NOAA (**\$298,130/Co-PI – 2015-2017**).
- Conducted storm water monitoring for Village Creek with the Trinity River Authority (TRA) and USGS with funding support from the City of Kennedale, Texas (**\$87,492/PI – 2015–2016**).
- Conducted hydrologic analysis of urbanization, infiltration, and moving standard project storms for the Fort Worth Floodway (TRWD - **\$233,831/PI - 2014-2016**).
- Conducting research in stormwater modeling and urban flooding, particularly in integrative sensing and prediction of urban water for sustainable cities (NSF#1442735 - **\$1,196,295/Co-PI/\$718,622 - UTA share – 2014-2018**).
- **Research Scientist/Project Manager, Rice University, Houston, TX.** (May 2007 – October 2013)
  - Managed the hydrologic and hydraulic analysis project for the Yuna River watershed in the Dominican Republic; collaborated researchers and engineers from the Dominican Republic's Water Resources Authority (INDRHI) and the Center for Space Research (CSR) at UT Austin to analyze and pinpoint areas for the LiDAR survey in order to develop digital elevation derived hydrologic and hydraulic models; led the team to develop hydrologic and hydraulic models and delineate floodplains for this watershed in order to carry out appropriate flood control design for the local government (**\$150,000**).
  - Developed a real-time flood warning system for the Highway 288 junction over Brays Bayou, a highly flood-prone section, using calibrated hydrologic/hydraulic models and real-time NEXRAD rainfall data. Highway 288 is a major evacuation route from the Gulf coast. The recently developed hydraulic prediction tool (FPML) was incorporated into this flood warning system to visualize floodplain in near real time; designed and developed another real-time radar-based flood warning system for two flood-prone locations: Mandell St. near SH-59 and Tellepsen Rd near IH-45 in Houston, Texas for TxDOT; calibrated the SWMM models for both locations and developed rainfall – water surface elevation correlations with a detailed hydrologic/hydraulic study in order to provide flood warning information in real-time based on radar rainfall information. This project is funded by TxDOT with **\$200,000** for two years.
  - Designed and developed a real-time flood warning system for several cross sections over Oyster Creek in Sugar Land, Texas. The flood alert system is based real-time NEXRAD radar rainfall data, a well-calibrated hydrologic model, and an operational data transfer platform. The project is funded by the City of Sugar Land with **\$80,000**.

- Re-evaluated the stormwater system in Harris Gully with updated drainage information, hydrologic & hydraulic models, land use information, and recently-installed flood control facilities. The project was funded by the Texas Medical Center with **\$50,000**.
- Re-evaluated the stormwater system and floodplain maps within the Rice University and its surrounding areas with updated land use information and flood control improvement. The project was funded by Rice University with **\$45,000**.
- Performed an analysis of inland flooding and storm surge risk for the Clear Lake City Water Authority (CLCWA) using information collected during Hurricane Ike (2009) and hydrologic & hydraulic models; the research results were used to inform local residents and governmental agencies how to deal with floods and hurricane induced storm surge; funding for local infrastructural improvements can be allocated upon these research results as well. The project was funded by CLCWA with **\$65,000**.
- Performed a pilot project that integrates a comprehensive coastal flood warning system with a “lifeline” evacuation analysis of the roadways and bridges on the Clear Lake areas in Texas. This project was funded by the Shell Sustainability Center with **\$42,000**.
- Coordinated major research universities (UT-Austin, TAMU, LSU, UH, etc.) and other public and private entities to collaborate and exchange technical information of inland flooding induced by severe storms for the Center of Severe Storm Prediction, Education, and Evacuation from Disasters (SSPEED) with funding from Houston Endowment (**\$2.5 Million**).
- Performed a study of storm surge impacts on the Houston Ship Channel using collected Hurricane Ike storm surge information, the results from Advanced Circulation Model (ADCIRC), and a 2-D MIKE-FLOOD model. This research was sponsored by the SSPEED center.
- Performed a study for a land development project within the Cypress Creek watershed using a distributed hydrologic model (Vflo<sup>TM</sup>) in order for the local agency to control and monitor overland runoffs from developed areas. The sizing and locations of detention ponds were determined by my simulated results. The results and recommendations were also published in the ASCE Journal of Hydrologic Engineering providing conceptual land planning suggestions.
- Conducted a hydrologic/hydraulic study for the confluence of Oyster Creek and Ditch B to provide multiple tailwater conditions. The located is about 700 feet downstream of Dulles Ave. in the City of Sugar Land. The tailwater conditions were simulated based on the calibrated Oyster Creek models and were developed for FEMA frequencies (10%, 2%, 1%, and 0.2%).
- Developed groundwater flow and transport models (GW-Vistas) to evaluate groundwater directions under fluctuations of Mississippi River and operations of city supply wells in Myrtle Grove in Louisiana. Different scenarios and boundary conditions were set up and simulated to see negative impact from a Dow refinery plant on the surrounding neighborhood. This work was done to provide expert opinions as support for a litigation case.
- Conducted numerous detailed hydrologic and hydraulic studies for the purpose of evaluating flood risk and the causes of flooding events for the litigation cases from California, Florida, Louisiana, and Texas.
- **Ph.D. Rice University, Houston, TX (March 2004- May 2008)**
  - Developed advanced features of real-time flood forecast and control systems for flood-prone areas by incorporating real-time radar and storm surge data. This research was supported on the center of Collaborative Adaptive Sensing of the Atmosphere (CASA) from the National Science Foundation (NSF).
  - Developed unsteady state hydraulic modeling system to accurately delineate flood maps. This research was supported by CASA, an ERC of NSF.
  - Developed a hydraulic prediction tool, floodplain map library (FPML) for FAS2 to dynamically respond to real-time radar rainfall. This system can provide emergency personnel more lead time to initiate strategic measures. This research was supported by CASA from NSF.
  - Managing Flood Alert System (FAS3) for the Texas Medical Center and Brays Bayou area to keep the system running properly on a daily basis for the past years.

- Developed and improved distributed models for Harris Gully area including the Texas Medical Center; incorporated pipe flow mechanism into the system to account for pressure flow; simulation results matched well with the measured data for historical rainfall events; awarded USGS Research Grant (\$5000) for this research work.
- Investigated in modeling groundwater flow for a former airplane jet repair facility in Connecticut, which was contaminated by chlorinated compounds used as grease detergent for many decades; modeled groundwater flow around a Dow Chemical facility in Louisiana; developed models for a contaminated site in Jerome, Florida to simulate creosote transport in groundwater using MODFLOW & MT3D.
- Accomplished a hydrologic and hydraulic analysis by using HEC-HMS and HEC-RAS for many local projects under various flooding scenarios.
- **Research Assistant, Lamar University, Beaumont, TX** (Jan 2001-May 2003)
  - Developed natural attenuation models accounting for injection of oxygen releasing compound; planned to design the injection, so as to optimize the increase in dissolved oxygen content in groundwater.
  - Established a regression analysis of concentration versus distance for stable plumes as an analytical solution for one-dimensional, steady state, contaminant transport; quantified biodecay rate constants based on field data; performed sensitivity analysis on the total decay rate constants.

### Scientific Societies

1. Texas licensed Professional Engineer (P.E.#109861)
2. Member of SIGMA XI
3. Member of American Society of Civil Engineers (ASCE)
4. Member of American Water Resources Association (AWRA)
5. Member of American Geophysical Union (AGU)
6. Member of Madison Who's Who

### Honors

- Eleanor & Mills Bennett Fellowship (\$24,000). (May, 2007)
- BP Student Travel Award (\$500) from American Institute of Hydrology (AIH) (May, 2006)
- Award from USGS through Texas Water Resources Institute (\$5,000) (March, 2005)

### Reviewer for Technical Journal Papers and Funding Agencies

1. Reviewer of the Journal of Climate Risk Management (Elsevier)
2. Reviewer of the Journal of Hydrologic Engineering (ASCE)
3. Reviewer of the Journal of Hydrometeorology (AMS)
4. Review of the Journal of Hydrology (Elsevier)
5. Reviewer of the Journal of Water Resources Planning and Management (ASCE)
6. Reviewer of the Journal of Natural Hazards Review (ASCE)
7. Reviewer of the Journal of the American Water Resources Association (AWRA)
8. Reviewer of the National Institutes of Water Resources (NIWR) – USGS National Competitive Grants Program.

### Funded Proposals

1. **National Science Foundation (NSF)** - Identification of urban flood impacts caused by land subsidence and sea level rise for the Houston-Galveston Region (NSF #1832065) (\$180,000) (2018-2020) – PI
2. **Texas Department of Transportation (TxDOT)** - Develop a Generalized Skew Update and Regional Study of Other Measures of Distribution Shape for Texas Flood Frequency Analyses (TXDOT 19-203) (\$125,862) (2018-2021) – PI (Funded).
3. **U.S. Department of Agriculture (USDA)** – ALFA-IoT: Alliance For Smart Agriculture in the Internet of Things Era (\$300,000) Co-PI (2018-2022) (Funded).

4. **Trinity River Authority (TRA)** - Developing a Water Management and Planning Tool for the Trinity River Authority (\$60,000) (2019-2020 – Phase II) – PI (Funded).
5. **City of Grand Prairie** – Developing a Flood Warning System for Grand Prairie – Phase II (\$69,980) (2018-2019) – PI.
6. **City of Carrollton** – Developing an Advanced Flood Warning System for the City of Carrollton (\$78,530) (2018-2019) – PI
7. **Trinity River Authority (TRA)** – Developing a Water Management and Planning Tool for TRA (\$60,000) (2018) – PI.
8. **U.S. Army Corps of Engineers (USACE)** – Water Resources Review and Research, Hydrology and Hydraulic Studies for the U.S. Army Corps of Engineers, Fort Worth District (**\$154,000/1<sup>st</sup>**) (**2017-2018**) (**The same funding will recur for the following four years with a total of \$770,000**) - PI
9. **City of Dallas and Dallas Housing Authority** - Performing Dallas-Fort Worth Regional Assessment of Fair Housing (**\$918,930**) (2016-2018) – Co-PI
10. **Western Michigan University (WMU)** – Assessing the Impact of Air Pollution on Public Health Along Transit Routes (\$103,324) (2017-2018) – Co-PI (Funded).
11. **City of Grand Prairie** – Developing a Flood Warning System for Grand Prairie (\$48,355) (2016-2017) – PI.
12. **City of Kennedale** – Conduct Storm Water Monitoring for Village Creek (\$87,492) (2015-2016) - PI
13. **Tarrant Regional Water District (TRWD)** – Conduct Hydrologic Analysis of Urbanization and Infiltration for the Fort Worth Floodway – (\$233,831) (2014-2016) – PI
14. **NOAA** – Climate Forecast-aided Drought Decision Support For North Central Texas (\$283,224) (2015-2017) – Co-PI.
15. **National Science Foundation (NSF)** – Integrative Sensing and Prediction of Urban Water for Sustainable Cities (Award#1442735) (\$1,196,295) (2014-2018) – Co-PI.
16. **Texas Medical Center** – Harris Gully Storm Water System Analysis (\$50,000) (2010)
17. **Rice University** – Rice University Floodplain Re-evaluation (\$45,000) (2010)
18. **Clear Lake City Water Authority** – Flood and Storm Surge Risk Analysis (\$ 65,000) (2009-2010)
19. **INDRHI** – H& H Study for the Dominican Republican Yuna River (\$150,000) (2008-2010).
20. **City of Sugar Land** – Real-time Flood Alert System for Oyster Creek (\$ 80,000) (2009).
21. **TxDOT** - TxDOT Flood Alert System for SH 288 Brays Bayou Section (\$200,000) (2007-2009).
22. **USGS** - Enhancing a Distributed Hydrologic Model for Storm Water Analysis within a GIS Framework in an Urban Area (\$5,000) (2005)  
<http://water.usgs.gov/wrri/05grants/2005TX193B.html>

### Workshops and Teaching Experience

1. Water Resources Engineering (CE3342) at UTA (2016 to Present)
2. Advanced GIS and Hydrologic/Hydraulic Modeling (CE4326/5349) at UTA (2014 to Present)
3. Water Systems Design (CE4328) at UTA (2014 to Present)
4. Advanced Hydrology (CE5347) at UTA (2013 to Present)
5. Engineering Hydrology (CIVE6361) at University of Houston (2012 to 2013)
6. Groundwater Contamination Transport Modeling (CEVE518) at Rice University. (2004 to 2013)
7. Urban Hydrology and Floodplain Analysis (CEVE412) at Rice University. (2004 to 2013)
8. GIS and its Applications (CEVE 512) at Rice University. (2004 to 2013)
9. Engineering Geographic Information System (CIVE7342) at University of Houston (Fall, 2010)
10. Flood Alert System Training Session at Texas Medical Center (August, 2015)
11. Flood Alert System Training Session at Texas Medical Center (May, 2014)
12. Flood Alert System Training Session at Texas Medical Center Library (September, 2010)
13. Flood Alert System Training Session at TxDOT (January, 2009)
14. Flood Alert System Training Session at Transtar (February, 2009)
15. Flood Alert System Training Session at Rice University (January, 2008)
16. Flood Alert System Training at Texas Medical Center Library. (March, 2007)
17. Mass Transfer Lab (CHEN4420) at Lamar University. (2001- 2003)

### Invited Seminars and Talks

1. ASCE Environmental Water Resource Institute (EWRI), Dallas and Fort Worth Branches (2018)
2. Society of American Military Engineers (SAME) Infrastructure Forum (2018)
3. ASCE International Sustainable Infrastructure Conference, Invited Panelist (2017)
4. ASCE Dallas Section Annual Meeting, Invited Keynote Speaker (2017)
5. Women's Policy Forum, Fort Worth, Invited Keynote Speaker (2017)
6. Civil and Environmental Engineering Department, Rice University (2017)
7. Environmental Water Resource Institute (EWRI), Dallas Branch (2017)
8. Society of American Military Engineers (SAME), Dallas Chapter (2016)
9. Spatiotemporal Storms, ASCE EWRI (2016)
10. Texas Weather Conference, The University of Texas at Austin (2016)
11. American Concrete Pipe Association (ACPA), The University of Texas at Arlington (2016)
12. Federal Interagency Water Management Workshop (2016)
13. Climate Forum, Jackson School of Geosciences, The University of Texas at Austin (2015)
14. EPA Pumping Energy Efficiency Workshop, Tarrant Regional Water District (2015)
15. Institute of Atmospheric Physics, Chinese Academy of Sciences (2015)
16. Beijing Meteorological Bureau, China (2015)
17. Hydraulic Engineering Department, Delft University of Technology, The Netherlands (2015)
18. Industrial and Manufacturing Department, The University of Texas at Arlington (2015)
19. Wier & Associates Engineering, Inc. (2015)
20. Civil and Environmental Engineering Department, Rice University (2014)
21. Catchment-based Hydrologic Model Data Assimilation (CAHMDA) and Hydrologic Ensemble Prediction Experiment (HEPEX-DAFOH) Joint Conference – Invited Lunch Speaker (2014)
22. Stormwater Management Department, The City of Fort Worth (2014)
23. Interagency Coordinating Meeting, Tarrant Regional Water District (TRWD)
24. CP&Y Engineering, Inc. (2014)
25. ASCE Summit on Flood Risk Management (2013)
26. Civil & Environmental Engineering Department, Rutgers University (2013)
27. Civil, Environmental & Oceanic Engineering Department, Stevens Institute of Technology (2013)

### Publications

#### Peer Reviewed Journal Papers

1. Bedient, P. B., Holder, A., and Thompson, J. F., and Fang, Z. (2007). "Modeling of Stormwater Response under Large Tailwater Conditions – Case Study for the Texas Medical Center". *ASCE Journal of Hydrologic Engineering*, Vol. 12, No. 3, May 1, 2007, ISSN 1084-0699/2007/3-256-266.
2. Fang, Z., Bedient, P. B., Benavidas J.A, and Zimmer A. L. (2008). "Enhanced Radar-based Flood Alert System and Floodplain Map Library". *ASCE Journal of Hydrologic Engineering*, Vol. 13, No. 10, October 1, 2008, ISSN 1084-0699/2008/10-926-938.
3. Fang, Z, Zimmer, A., Bedient, P. B, Robinson, H., Christian, J., and Vieux, B. E. (2010). "Using a Distributed Hydrologic Model to Evaluate the Location of Urban Development and Flood Control Storage". *ASCE Journal of Water Resources Planning and Management*, Vol. 136, No. 5, September, 2010, ISSN 0733-9496/2010/5-597-601.
4. Fang, Z., Bedient, P. B., and Buzcu-Guven, B. (2011). "Long-Term Performance of a Flood Alert System and Upgrade to FAS3: A Houston Texas Case Study". *ASCE Journal of Hydrologic Engineering*, Vol. 16, No. 10, October 1, 2011, ISSN 1084-0699/2011/10-818-828.
5. Christian, J., Teague, A., Duenas-Osario, L., Fang, Z., and Bedient, P. (2012). "Uncertainty in Floodplain Delineation: Expression of Flood Hazard and Risk in a Gulf Coastal Watershed". *Wiley Journal of Hydrological Processes*, DOI: 10.1002/hyp.9360.

6. Fang, Z., Dolan, G., Sebastian A., and Bedient, P.B. (2014). "Case Study: Flood Mitigation and Hazard Management at the Texas Medical Center in the Wake of Tropical Storm Allison (2001)". *ASCE Journal of Natural Hazards Review*, ISSN 1527-6988/05014001(11), 15(3).
7. Christian, J.K., Fang, Z., Torres, J., Deitz, R., and Bedient, P.B. (2014). "Modeling the Hydraulic Effectiveness of a Proposed Storm Surge Barrier System for the Houston Ship Channel during Hurricane Events". *ASCE Journal of Natural Hazards Review*, ISSN 1527-6988/04014015(11), 15(4).
8. Juan, A., Fang, Z., and Bedient, P. B. (2015). "Developing a Radar-based Flood Alert System for Sugar Land, Texas", *ASCE Journal of Hydrologic Engineering*, 10.1061/(ASCE)HE.1943-5584.0001194 , E5015001.
9. Torres, J., Bass, B., Irza, N., Fang, Z., Proft, J., Dawson, C., Kiani, M., and Bedient, P.B. (2015). "Characterizing the Hydraulic Interactions of Hurricane Storm Surge and Rainfall-Runoff for the Houston-Galveston Region". *Journal of Coastal Engineering*, Elsevier (2015) 7-9/0378-3839 <http://dx.doi.org/10.1016/j.coastaleng.2015.09.004>.
10. Juan, A., Hughes, C.M., Fang, Z., and Bedient, P. B. (2016). "Hydrologic Performance of Watershed-Scale Low Impact Development (LID) in a Highly Intensity Rainfall Region", *ASCE Journal of Irrigation and Drainage Engineering*, 10.1061/(ASCE)IR.1943-4774.0001141, 04016083.
11. Bass, B., Juan, A., Avantika, G., Fang, Z., and Bedient, P.B. (2016). "2015 Memorial Day Flood Impacts for Changing Watershed Conditions in Houston, TX". *ASCE Journal of Natural Hazards Review*, 10.1061/(ASCE)NH.1527-6996.0000241, 05016007.
12. Zhang, J., Munasinghe, D., Huang, Y.F., Fang, Z., Cohen, S., and Tsang, Y.P (2018). "Comparative Analysis of Inundation Mapping Approaches for the 2016 Flood in the Brazos River, Texas", *AWRA Journal of the American Water Resources Association (JAWRA)* 1–14. <https://doi.org/10.1111/1752-1688.12623>.
13. Munasinghe, D., Cohen, S., Huang, Y., Tsang, Y., Zhang, J. and Fang, Z. (2018). "Inter-comparison of Satellite Remote Sensing Techniques of Flood Inundation Mapping". *AWRA Journal of the American Water Resources Association (JAWRA)* 1–12. <https://doi.org/10.1111/1752-1688.12626>.
14. Gao, S., and Fang, Z. (2018). "Using Storm Transposition to Investigate the Relationships between Hydrologic Responses and Spatial Moments of Catchment Rainfall". *ASCE Journal of Natural Hazards Review*, ASCE 2018 19(4):04018015 DOI:10.1061/(ASCE)NH.1527-6996.0000304
15. Shen, C., Layloy, E., Albert, A., Chang, F.J., Elshorbagy, A., Ganguly, S., Hsu, K.L., Kifer, D., Fang, Z., Fang, K., Li, D., Li, X., and Tsai, W.P., (2018). "HESS Opinions: Deep Learning as a Promising Avenue toward Knowledge Discovery in Water Sciences", *EGU Journal of Hydrology and Earth System Sciences (HESS)*, *Hydrol. Earth Syst. Sci.*, 22, 5639–5656, 2018; <https://doi.org/10.5194/hess-22-5639-2018>.
16. Fang, N.Z., Shultz, M, Wienhold K.J., Gao, S., and Zhang, J. (2019). "Case Study: Comparative Analysis of Hydrologic Simulations with Areal-Averaging of Moving Rainfall", *Hydrology* 2018, 6(1), 12: <https://doi.org/10.3390/hydrology6010012>.
17. Kiani, M., Fang, Z., and Rafieeiniasab, A. (2018). "Improving the Rainfall and Flood Frequency Analysis Using Stochastic Storm Transposition Method for the Upper Trinity River Watershed", *Journal of Hydrology*, Elsevier (2016) (In Review).
18. Gao, S. and Fang, Z. (2018). "Development and Evaluation of a Dynamic Moving Storm (DMS) Generator to Understand Spatiotemporal Characteristics of Storms". *Journal of Hydrologic Processes* (In Review).



19. Fang, Z., Christian, J. K., Gao, S., Li, D. and Bedient, P. B. (2018). "Using a 2-D Hydrologic and Hydraulic model to Re-evaluate a Highly Urbanized area with More Detailed Information". *ASCE Journal of Hydrologic Engineering*, ASCE (In Review).
20. Gao, S., Zhang, J., Li, D., Jiang, H., and Fang, Z. (2018). "Comparative Rainfall Analysis for Hurricane Harvey over Harris County". *ASCE Journal of Natural Hazards Review*, ASCE (In Review).
21. Gao, S. and Fang, Z. (2018). "Highly Variable Rainfall with its Hydrologic and Hydraulic Impacts on Urban Watersheds Considering the Spatiotemporal Variability". *ASCE Journal of Hydrologic Engineering*, ASCE (In Preparation).
22. Fang, Z., Bedient, P. B., Zhang, J., and Li, D. (2018). "Performance of a Flood Alert System During Hurricane Harvey: A Houston Texas Case Study". *ASCE Journal of Hydrologic Engineering* (In Preparation).
23. Wienhold, K., Li, D., and Fang, Z. (2018). "A Thermal Inertia Approach to Precision Irrigation using Unmanned Aerial Vehicles Combined with High-Resolution Multispectral Imagery". *ASCE Journal of Irrigation and Drainage Engineering* (In Preparation).

#### Books or Chapters

1. Fang, Z., Safiolea, E., Bedient, P.B. (2006). "Enhanced Flood Alert and Control Systems for Houston." in Chapter 16, *Coastal Hydrology and Processes*, Ed. by Vijay P. Singh and Y. Jun Xu, Water Resource Publications, LLC, pp. 199-210 (<http://www.wrpllc.com/books/chp.html>).
2. Lindner, J., Schwertz, D., Bedient, P. B., and Fang, Z. (2012) "Flood Prediction and Flood Warning Systems". In Chapter 4, *Lessons from Hurricane Ike*, Ed. by Philip B. Bedient, Texas A&M University Press, ISBN-10: 1-60344-588-9, pp. 38-49.
3. Fang, Z. and Doubleday, G. (2012). "Hydrologic Simulation Models" in Chapter 5, *Hydrology and Floodplain Analysis*, 5<sup>th</sup> Ed., by Philip B. Bedient, Wayne Huber, and Baxter Vieux, Pearson Education, Inc., Upper Saddle River, New Jersey, ISBN-13:978-0-13-256796-1, pp. 290-334.
4. Fang, Z., Sebastian A., and Bedient, P.B. (2014). "Modern Flood Prediction and Warning Systems." *Handbook of Engineering Hydrology: Fundamentals and Applications* (Chapter 21), Vol. 1, Taylor & Francis Inc. ISBN-10:1466552417.
5. Fang, Z. and Doubleday, G. (2018). "Hydrologic Simulation Models" in Chapter 5, *Hydrology and Floodplain Analysis*, 6<sup>th</sup> Ed., by Philip B. Bedient, Wayne Huber, and Baxter Vieux, Pearson Education, Inc., Upper Saddle River, New Jersey, ISBN-13:978-0-13-475197-9, pp. 297-340.
6. Fang, Z., Juan A., and Nikiel C. (2018). "Case Studies in Water Resources" in Chapter 13, *Hydrology and Floodplain Analysis*, 6<sup>th</sup> Ed., by Philip B. Bedient, Wayne Huber, and Baxter Vieux, Pearson Education, Inc., Upper Saddle River, New Jersey, ISBN-13:978-0-13-475197-9, pp. 717-759.

#### Conference Papers and other Technical Publications

1. Fang, Z., Li, K., Gadgil, S., and Gossage, J. L. (2005). "Study of Natural Attenuation of Chlorinated Benzenes in Groundwater" The 15<sup>th</sup> Annual AEHS Meeting and West Coast Conference on Soils, Sediments and Water Analysis, Fate, Environmental and Public Health Effects, and Remediation. San Diego, California, March 14-17, 2005.  
<http://www.aehs.com/conferences/westcoast/pdfs/FinalProgram2005.pdf>
2. Fang, Z., Safiolea, E., Bedient, P. B., and Vieux, B. E. (2005). "Enhanced Flood Alert System for Houston". 2005 National Hydrologic Warning Council Conference: Flood Warning Systems, Technologies and Preparedness. Sacramento, California, May 16-20, 2005.

[http://www.alertsystems.org/af\\_ecug/nhwc\\_agenda\\_2005.pdf](http://www.alertsystems.org/af_ecug/nhwc_agenda_2005.pdf)

3. Fang, Z., Bedient, P.B., and Hovinga, R. (2005). "Living with Severe Storms in the Gulf Coast", Rice University, TX, September 23, 2005.
4. Fang, Z., Bedient, P. B., Hovinga, R. (2006). "Prediction of Severe Storm Flood Levels for Houston Using Hurricane Induced Storm Surge Models in GIS Frame". Proceedings of American Water Resource Association 2006 Spring Specialty Conference: GIS and Water Resources IV. Houston, Texas, May 8-10, 2006.
5. Fang, Z., Bedient, P. B. (2006). "Enhanced Flood Alert and Control Systems for Houston". Proceedings of 25<sup>th</sup> American Institute of Hydrology Conference: Challenges of Coastal Hydrology and Water Quality. Baton Rouge, Louisiana, May 21-24, 2006.
6. Fang, Z. (2006). "Enhancing a Distributed Hydrologic Model: Addition of Storm Water Pipe Analysis within a GIS Framework in an Urban Area." Texas Water Resources Institute, College Station, Texas ([http://twri.tamu.edu/usgs/2005-06/fang\\_report.pdf](http://twri.tamu.edu/usgs/2005-06/fang_report.pdf)).
7. Fang, Z., Bedient, P.B., and Hovinga, R. (2006). "Advanced Flood Alert System Using Storm Surge Data Linked to Inundation Map Library." Disaster Recovery and Redevelopment Interdisciplinary Student Research Symposium, College Station, Texas, October 6-7, 2006.
8. Fang, Z. and Bedient, P.B. (2006). "Houston Flood Alert and Response – 2006." Annual Conference of Collaborative Adaptive Sensing of Atmosphere, sponsored by Engineering Research Center of National Science Foundation, October 15-17, Estes Park, Colorado.
9. Fang, Z., Gordon, M.R., and Bedient, P.B. (2006). "Installation of First Radar at TMC for Flood Alert System." Annual Conference of Collaborative Adaptive Sensing of Atmosphere, sponsored by Engineering Research Center of National Science Foundation, October 15-17, Estes Park, Colorado.
10. Fang, Z. and Bedient, P.B. (2007). "The Future of Flood Prediction in Coastal Areas" Severe Storm Prediction, Evacuation, and Education from Disasters Conference, Rice University, May 8-10, Houston, TX.
11. Fang, Z. and Bedient, P.B. (2007). "Radar-based Flood Warning System Using Dynamic Floodplain Map Library." Proceedings of World Environmental & Water Resources Congress 2007, Environmental and Water Resources Institute (EWRI), ASCE, Tampa, Florida, May 15-19.
12. Fang, Z. and Bedient, P.B. (2007). "Advanced Radar-based Flood Alert System Using Storm Surge Data Linked to Inundation Map Library". 2nd International Symposium of Flood Forecasting and Management with GIS and Remote Sensing (ICFRHWE'07), September 17-19, Guangzhou, China.
13. Fang, Z. and Bedient, P.B. (2007). "Real-time Hydraulic Prediction Tool – FloodPlain Map Library (FPML)". American Water Resources Association (AWRA) 2007 Annual Conference, November 12-15, Albuquerque, New Mexico.
14. Fang, Z. and Bedient, P.B. (2007). "Enhanced NEXRAD Radar-based Flood Warning System with Hydraulic Prediction Feature: Floodplain Map Library (FPML)". American Geophysical Union 2007 Fall Meeting, December 10-14, San Francisco, CA.
15. Fang, Z. and Bedient, P.B. (2008). "Floodplain Map Library (FPML): Innovative Method for Flood Warning System for Urban Watershed in Houston, TX". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Honolulu, Hawaii, May 13-16.
16. Fang, Z. and Bedient, P.B. (2008). "Flood Inundation Prediction and Performance during Hurricane Ike". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.

17. Fang, Z. and Bedient, P.B. (2008). "Predicting and Managing Severe Storms in the Gulf Coast through University Research". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
18. Robinson, H., Fang, Z. and Bedient, P.B. (2008). "Distributed Hydrologic Model Development in the Topographically Challenging Yuna River Watershed, Dominican Republic". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
19. Ray, T., Fang, Z. and Bedient, P.B. (2008). "Assessment of Flood Risk Due to Storm Surge in Coastal Bayous Using Dynamic Hydraulic Modeling". Proceedings of Severe Storm Prediction and Global Climate Impact in the Gulf Coast Conference 2008, Houston, Texas, October 28-31.
20. Fang, Z. and Bedient, P.B. (2008). "Advanced Flood Alert System with Hydraulic Prediction for a Major Evacuation Route in Houston". Proceedings of American Water Resources Association (AWRA) Annual Conference 2008, New Orleans, Louisiana, November 17-20.
21. Fang, Z. and Bedient, P.B. (2008). "NEXRAD Radar-based Hydraulic Flood Prediction System for a Major Evacuation Routes in Houston". American Geophysical Union 2008 Fall Meeting, December 15-19, San Francisco, CA.
22. Fang, Z. and Bedient, P.B. (2009). "Flood Warning Systems for Urban Flooding". Grand Challenges in Coastal Resiliency I: Transforming Coastal Inundation Modeling to Public Security, January 20-21, Baton Rouge, LA.
23. Fang, Z. and Bedient, P.B. (2009). "Advanced Radar-based Flood Forecasting Systems for a Highly Urbanized Coastal Area and SSPEED Center", ASCE/TFMA Flood Awareness and Flood Response Workshop, April 29, San Marcos, TX.
24. Fang, Z. and Bedient, P.B. (2009). "Flood Inundation Prediction and Performance During Hurricane Ike". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Kansas City, Missouri, May 17-21.
25. Robinson, H., Fang, Z. and Bedient, P.B. (2009). "Distributed Hydrologic Modeling of the Yuna River Watershed in the Dominican Republic". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Kansas City, Missouri, May 17-21.
26. Ray, T., Fang, Z., and Bedient, P.B. (2009). "Assessment of Flood Risk Due to Storm Surge in Coastal Bayous Using Dynamic Hydraulic Modeling". Proceedings of World Environmental & Water Resources Congress 2008, Environmental and Water Resources Institute (EWRI), ASCE, Kansas City, Missouri, May 17-21.
27. Fang, Z. and Bedient, P.B. (2009). "Radar-based Flood Alert System for Coastal Area and Collaborated Efforts for Disaster Prevention and Risk Management". IRCD 34<sup>th</sup> Annual Natural Hazards Research and Applications Workshop – Hazards and the Economy: Challenges and Opportunity, July 15-18, Boulder, CO.
28. Fang, Z. and Bedient, P.B. (2009). "Radar-based Flood Warning System for Houston and Its Performance Evaluation". American Geophysical Union (AGU) 2009 Fall Meeting, December 14-18, San Francisco, CA.
29. Su, D., Fang, X., and Fang, Z. (2010). "Effectiveness and Downstream Impacts of Stormwater Detention Ponds Required for Land Development". Proceedings of World Environmental & Water Resources Congress 2010 – Challenges of Change, Environmental and Water Resources Institute (EWRI), ASCE, Providence, Rhode Island, May 16-20.

30. Bedient, P. B. and Fang, Z. (2010). "Advanced Radar-based Flood Warning System for Hurricane-prone Urban Areas and Performance during Recent Events", 2<sup>nd</sup> International Conference on Flood Recovery, Innovation and Response (FRIAR), Milano, Italy, May 26-28.
31. Fang, Z., Juan, A., Bedient, P. B., Kumar, S., and Steubing, C. (2010). "Flood Alert System for Upper Oyster Creek Watershed in Sugar Land, Texas using NEXRAD, HEC-HMS, HEC-RAS, and GIS", ASCE/TFMA, TFMA 2010 Annual Conference, Fort Worth, Texas, June 7- 10.
32. Fang, Z. and Bedient, P. B. (2010). "Radar Applications in Flood Warning System for an Urban Watershed in Houston, Texas", Remote Sensing and Hydrology 2010 Symposium – Special Session on Flood Forecasting and Management with Remote Sensing and GIS, Jackson Hole, WO, September 27 -30.
33. Bedient, P. B., Fang, Z., and Vieux, B. E. (2010). "Radar-based Flood Warning System for the Texas Medical Center and Performance Evaluation", National Flood Workshop, Houston, Texas, October 24-26.
34. Fang, Z., Juan, A., Bedient, P. B., Kumar, S., and Steubing, C. (2011). "Flood Warning Indicator: Establishing a Reliable Radar-Based Flood Warning System for the Upper Oyster Creek Watershed", ASCE/TFMA, TFMA 2011 Annual Conference, Sugar Land, Texas, April 11- 14.
35. Christian, J. K., Fang, Z., and Bedient, P. B. (2011). "Probabilistic Floodplain Delineation", 2011 World Environmental and Water Resources Congress, Palm Springs, CA.
36. Fang, Z. and Bedient, P. B. (2012). "Creating Flood Alert Systems in Coastal Areas", SSPEED Conference – Gulf Coast Hurricanes: Mitigation and Response, Houston, Texas, April 10.
37. Fang, Z. and Bedient, P. B. (2012). "Advanced Radar-Based Flood Warning System for Urban Areas and its Performance Evaluation", SSPEED Conference – Gulf Coast Hurricanes: Mitigation and Response, Houston, Texas, April 11.
38. Fang, Z. and Bedient, P. B. (2012). "The Performance Evaluation of a NEXRAD-Based Flood Warning System during Recent Events in 2012", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
39. Juan, A., Fang, Z., and Bedient, P. B. (2012). "Flood Warning Indicator: Establish a Reliable Radar-Based Flood Warning System for Sugar Land, Texas", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
40. Deitz, R., Christian, J. K., Wright, G., Fang, Z., and Bedient, P. B. (2012). "Linkage of Rainfall-Runoff and Hurricane Storm Surge in Galveston Bay", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
41. Bedient, P. B., Doubleday, G., Sebastian, A., and Fang, Z. (2012). "Distributed Hydrologic Modeling of LID in the Woodlands, Texas", American Geophysical Union (AGU) 2012 Fall Meeting, San Francisco, CA, December 3-7.
42. Fang, Z. and Bedient, P. B. (2013). "Evaluating Radar-based Flood Warning System (Texas Medical Center). National Hydrologic Warning Council – 2013 Training Conference & Exposition, Ponte Vedra, FL, June 3-6.
43. Fang, Z. and Bedient, P. B. (2013). "Urban Flood Warning Systems using Radar Technologies", American Geophysical Union (AGU) 2013 Fall Meeting, San Francisco, CA, December 9-13.
44. Torres, J., Fang, Z., Bedient, P.B., and Christian, J. (2013). "Modeling the Effectiveness of a Storm Surge Barrier System for the Houston Ship Channel during Hurricane Events", American Geophysical Union (AGU) 2013 Fall Meeting, San Francisco, CA, December 9-13.

45. Fang, Z. (2014). "An Operational Radar-based Flood Warning System for Highly Urban Areas in Houston, Texas", American Meteorological Society (AMS) 2014 Annual Meeting, Atlanta, GA, February 2-6.
46. Fang, Z. and Bedient, P. B. (2014). "Weather Radar and Real-time Flood Warning System for Urban Areas", ASCE/EWRI – International Symposium Weather Radar and Hydrology (WRaH), Washington, DC, April 7-9.
47. Torres, J., Fang, Z., and Bedient, P.B. (2014). "Modeling and Evaluating a Proposed Storm Surge Structure for the Houston Ship Channel in Texas", ASCE World Environmental & Water Resources (EWRI) Congress 2014, Portland, OR, June 1-5.
48. Fang, Z. and Bedient, P.B. (2014). "An Operational Radar-based Flood Warning System for Highly Urbanized Area in Texas", Invited Lunch Speaker at the Catchment-based Hydrologic Model Data Assimilation (CAHMDA) and Hydrologic Ensemble Prediction Experiment (HEPEX-DAFOH) Joint Workshop, the University of Texas at Austin, September 8-12.
49. Fang, Z. (2014). "Development and Evaluation of a Dynamic Moving Storm (DMS) Builder and its Applications in Flood Vulnerability Assessment", Invited Seminar at the Civil and Environmental Engineering Department at Rice University, Houston, TX, Oct 3.
50. Seo D., Fang, Z., Yu, X., Gao, J., Kerkez, B., and Zink, M. (2014). "ISPUW: A Vision for Integrated Sensing and Prediction of Urban Water for Sustainable Cities", Dynamic Data-Driven Environmental Systems Science (DyDeSS) Conference, Cambridge, MA, November.
51. Gao, S. and Fang, Z. (2014). "Development and Evaluation of a Dynamic Moving Storm (DMS) Builder", American Geophysical Union (AGU) 2014 Fall Meeting, San Francisco, CA, December 15-19.
52. Seo D., Fang, Z., Yu, X., Gao, J., Kerkez, B., and Zink, M. (2014). "ISPUW: Integrated Sensing and Prediction of Urban Water for Sustainable Cities", American Geophysical Union (AGU) 2014 Fall Meeting, San Francisco, CA, December 15-19.
53. Fang, Z., Gao, S., and Kiani, M. (2015). "In-situ Measuring and Evaluating Infiltration Rates of a Bio-filtration System in North Texas", ASCE World Environmental & Water Resources (EWRI) - International Low Impact Development Conference, Houston, TX, January 19-21, 2015.
54. Fang, Z. (2015). "Review of Low Impact Development Practices in the Houston Area for Stormwater Management", Invited lunch speech at Wier & Associates, Inc., Arlington, TX, January 28, 2015.
55. Fang, Z. (2015). "Development and Evaluation of a Dynamic Moving Storm (DMS) Builder and the Stochastic Storm Transposition Method", Invited Seminar at the Hydraulic Engineering Department at Delft University of Technology, Delft, Netherlands, April 9.
56. Fang, Z. (2015). "Development and Evaluation of a Dynamic Moving Storm (DMS) Builder and Its Applications in Flood Vulnerability Assessment", Invited Seminar at the Industrial Engineering Department at the University of Texas at Arlington, Arlington, TX, April 27.
57. Gao, S. and Fang, Z. (2015). "A Parametric Model for Generating Dynamic Moving Rainfall Events with Spatially and Temporally Varied Precipitation Intensities", ASCE World Environmental & Water Resources (EWRI) Congress, Austin, Texas, May 17-21.
58. Kiani, M., Benson, S., Cotter, J., and Fang, Z. (2015). "A Compound Approach for Transposition Extreme Storm Events using HEC-MetVue with Calibrations for Coastal Watersheds", ASCE World Environmental & Water Resources (EWRI) Congress, Austin, Texas, May 17-21.
59. Torres, J., Irza, J. N., Bass, B., Kiani, M., Fang, Z., Proft, J., Dawson, C., and Bedient, P. B. (2015). "Modeling the Hydraulic Performance of a Dynamic Surge Barrier System at the Houston Ship

- Channel under Variable Hurricane Rainfall-Runoff and Storm Surge Conditions". ASCE World Environmental & Water Resources (EWRI) Congress, Austin, Texas, May 17-21.
60. Seo D., Fang, Z., Yu, X., Gao, J., Kerkez, B., and Zink, M. (2015). "Integrated Sensing and Prediction of Urban Water for Sustainable Cities", ASCE World Environmental & Water Resources (EWRI) Congress, Austin, Texas, May 17-21.
  61. Fang, Z. (2015). "Integrated Sensing and Prediction of Urban Water for Sustainable Cities (iSPUW)", the NSF Sustainable Urban Water Workshop at the University of Texas at Arlington, Texas, June 4-5.
  62. Fang, Z. (2015). "An Operational Radar-based Flood Warning System for Highly Urbanized Area in Texas", Invited Speaker at the Beijing Meteorological Bureau, Beijing, China, June 23.
  63. Fang, Z. (2015). "An Operational Radar-based Flood Warning System for Highly Urbanized Area in Texas", Invited Speaker at the Institute of Atmospheric Physics – Chinese Academy of Sciences, Beijing, China, June 25.
  64. Gao, S. and Fang, Z. (2015). "A Multivariate Statistical Approach based on a Dynamic Moving Storms (DMS) Generator for Estimating the Frequency of Extreme Storm Events", American Geophysical Union (AGU) 2015 Fall Meeting, San Francisco, CA, December 14-18.
  65. Kiani, M. and Fang, Z. (2015). "Flood Frequency Analyses using a Modified Stochastic Storm Transposition Method", American Geophysical Union (AGU) 2015 Fall Meeting, San Francisco, CA, December 14-18.
  66. Seo D., Fang, Z., Yu, X., Gao, J., Kerkez, B., and Zink, M. (2015). "Integrative Sensing and Prediction of Urban Water for Sustainable Cities (ISPUW)", American Geophysical Union (AGU) 2015 Fall Meeting, San Francisco, CA, December 14-18.
  67. Fang, Z., Bass, B., and Bedient, P.B. (2016). "An Operational Radar-based Flood Warning System with its Performance Evaluation for the 2015 May 26 Event in Houston, Texas", The Texas Weather Conference, The University of Texas at Austin, Feb 5-6, 2016.
  68. Gao S. and Fang, Z. (2016). "Application of Monte Carlo Simulation Based on a Dynamic Moving Storms (DMS) Generator for Estimating the Flood Risk of Extreme Storm Events", ASCE World Environmental & Water Resources (EWRI) Congress, West Palm Beach, Florida, May 22-26, 2016.
  69. Zhang, J., Munasinghe, D., Huang, Y.F., Fang, Z., Cohen, S., and Tsang, Y.P (2016). "Comparison of Flood Inundation Mapping Techniques between Different Modeling Approaches and Satellite Imagery", American Geophysical Union (AGU) 2016 Fall Meeting, San Francisco, CA, December 11-15.
  70. Gao, S. and Fang, Z. (2016). "Evaluating Potential Hydrological Impacts from Rainfall Spatiotemporal Uncertainties Based on a Dynamic Moving Storm (DMS) Generator", American Geophysical Union (AGU) 2016 Fall Meeting, San Francisco, CA, December 11-15.
  71. Gao, S. and Fang, Z. (2017). "Parameter Retrieval from Radar Rainfall Data to Validate a Dynamic Moving Storm (DMS) Generator", American Meteorological Society (AMS) 2017 Annual Meeting, Seattle, WA, January 22-26.
  72. Yung, A., Fang, Z., Griffin, S., Fulfer, B., and Keith, J. (2017). "Grand Prairie Flood Warning System – Scalable, Reliable, and Relevant Information Supporting First Responders", Texas Floodplain Management Association (TFMA), Richardson, TX, April of 2017.
  73. Yung, A., Fang, Z., Griffin, S., Fulfer, B., and Keith, J. (2017). "The Water is Rising – Scalable, Reliably, and Relevant Flood Warning and Forecasting Supporting First Responders", The Association of State Floodplain Managers (ASFPM), MI, June of 2017.

74. Li, D. and Fang, Z. (2017). "Daily Reservoir Inflow Forecasting using Deep Learning with Downscaled Multi-General Circulation Models (GCMs) Platform". American Geophysical Union (AGU) 2017 Fall Meeting, December 11-15, New Orleans, LA.
75. Wienhold, K. Li, D. and Fang, Z. (2017). "A Smart Irrigation Approach Aided by Monitoring Surface Soil Moisture using Unmanned Aerial Vehicles". American Geophysical Union (AGU) 2017 Fall Meeting, December 11-15, New Orleans, LA.
76. Zhang, J and Fang, Z. (2017). "Assessment of the Effects of Various Precipitation Forcings on Flood Forecasting Potential Using WRF-Hydro Modeling". American Geophysical Union (AGU) 2017 Fall Meeting, December 11-15, New Orleans, LA.
77. Shang, G and Fang, Z. (2017). "Evaluate Hydrologic Response on Spatiotemporal Characteristics of Rainfall Using High Resolution Radar Rainfall Data and WRF-Hydro Model". American Geophysical Union (AGU) 2017 Fall Meeting, December 11-15, New Orleans, LA.
78. Fang, Z., Cotter, J., Gao, S., Bedient, P.B., Yung A., Penland C. (2017). "Flood Inundation Mapping and Emergency Operations during Hurricane Harvey". American Geophysical Union (AGU) 2017 Fall Meeting, December 11-15, New Orleans, LA.
79. Fang, Z. and Bedient, P.B. (2018). "Operational Flood Warning System and Its Performance during Hurricane Harvey", American Meteorological Society (AMS) 2018 Annual Meeting, January 7-11, Austin, TX.
80. Shang, G and Fang, Z. (2018). "Evaluate Spatiotemporal Characteristics Retrieved from High Resolution Radar Rainfall Data and Corresponding Hydrologic Impacts". American Meteorological Society (AMS) 2018 Annual Meeting, January 7-11, Austin, TX.
81. Fang, Z. (2018). "Flood Warning Systems during Harvey". Urban Flooding and Infrastructure: Moving Forward from Harvey, SSPEED, February 21-22, Houston, TX.
82. Fang, Z. (2018). "UAV Advanced Sensors, Capabilities and Research: the MavAir Experience", 2018 National Chi Epsilon Conclave, March 15, Arlington TX.
83. Gao, S., Zhang, J., Li, D., Han, J., and Fang, Z. (2018). "Evaluate the Performance of Multi-Radar Multi-Sensor (MRMS) and Stage IV Gauge-Adjusted Qualitative Precipitation Estimate (QPE) during Hurricane Harvey". 2018 Texas Weather Conference (TWC), September 21-22, Arlington, Texas.
84. Li, D., Fang, Z., Zhang, J., and Bedient, P.B. (2018). "Advanced Flood Warning System and its Performance". Texas Weather Conference (TWC), September 21-22, Arlington, Texas.
85. Fang, Z. and Zhang, J. (2018). "Investigate the Loss-Related Variables to the Simulated Runoff Response in the Upper Trinity River Basin using WRF-Hydro". Texas Weather Conference (TWC), September 21-22, Arlington, Texas.
86. Yung, A., Terry, J., Lindner, J., Fang, Z., Hughes, C. (2018). "Rapid Response Inundation Mapping of Hurricane Harvey using a Volumetric Approach and 2D HEC-RAS in Harris County". Texas Weather Conference (TWC), September 21-22, Arlington, Texas.
87. Gao, S., Zhang, J., Li, D., Han, J., and Fang, Z. (2018). "Evaluation of Multi-Radar Multi-Sensor (MRMS) and Stage IV Gauge-Adjusted Qualitative Precipitation Estimate (QPE) during Hurricane Harvey". American Geophysical Union (AGU) 2018 Fall Meeting, December 10-14, D.C.
88. Fang, Z. and Zhang, J. (2018). "Investigate the Spatial Pattern of Loss-Related Variables to the Simulated Runoff Response". American Geophysical Union (AGU) 2018 Fall Meeting, December 10-14, D.C.

89. Li, D., Fang, Z., Zhang, J., and Bedient, P.B. (2018). "Advanced Flood Warning System and its Performance during Hurricane Harvey". American Geophysical Union (AGU) 2018 Fall Meeting, December 10-14, D.C.
90. Liu, Y., Li, J., and Fang, Z. (2019). "Local Sea Level Rise and its Projection in the Galveston Bay of Mexico Gulf". ASCE World Environmental & Water Resources (EWRI) Congress, Pittsburgh, Pennsylvania, May 19-23, 2019.
91. Li, D. and Fang, Z. (2019). "Development of Daily Naturalized/Unimpaired Flow at USGS Gauge Locations using Machine Learning Methods". ASCE World Environmental & Water Resources (EWRI) Congress, Pittsburgh, Pennsylvania, May 19-23, 2019.
92. Shang, G., Fang, Z., Cotter, J., Mosser, H., and Benson, S. (2019). "Optimize the Centering Locations and Orientation of Spatially Varied Design Storms over Watersheds Using Shuffled Complex Evolution Algorithm", Federal Interagency Sedimentation and Hydrologic Modeling Conference, June 24-28, Reno, NV.
93. Zhang, J., Fang, Z., and Cotter, J. (2019). "Investigate the Initial and Constant Losses during Rare and Extreme Rainfall Events in Upper Trinity River Basin", Federal Interagency Sedimentation and Hydrologic Modeling Conference, June 24-28, Reno, NV.

#### Dissertation and Thesis

1. Fang, Z. (2007). Doctoral dissertation: A Dynamic Hydraulic Floodplain Map Prediction Tool for Flood Alert in a Coastal Urban Watershed Considering Storm Surge Issues. Civil and Environmental Engineering Department, Rice University, Houston, Texas.
2. Fang, Z. (2003). Master's thesis: Modeling Natural Attenuation and Enhanced Natural Attenuation of Chlorinated Benzenes in Groundwater. Chemical Engineering Department, Lamar University, Beaumont, Texas.

#### **References Available Upon Request**



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