

**Cyndi V. Castro, PhD, PE**  
**NSF Postdoctoral Fellow**

University of Illinois at Urbana-Champaign  
Department of Civil & Environmental Engineering  
Department of Geography & Geographic Information Science  
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**RESEARCH INTERESTS**

Hydrology/hydraulics; human-water systems; nature-based solutions; multi-objective decision-making; water resources management; stakeholder behavior; participatory modeling; hydrodynamic optimization; geospatial informatics; cyber geographic information systems; spatiotemporal scaling; system dynamics; network topology; resilience and sustainability

**EDUCATION**

12/2021 Ph.D., Civil & Environmental Engineering, University of Houston  
2016 M.S., Civil & Environmental Engineering, University of Texas at Austin  
2011 B.S., Civil Engineering (Cum Laude), Texas A&M University at College Station

**PROFESSIONAL APPOINTMENTS**

2022 – **Postdoctoral Fellow**, University of Illinois at Urbana-Champaign, Department of Civil & Environmental Engineering, Urbana, IL

2019-2020 **Flood Recovery Analyst**, City of Houston Mayoral Office, Department of Resilience & Sustainability, Houston, TX

2018-2019 **Research Fellow**, University of Houston, Department of Civil & Environmental Engineering, Houston, TX

2016-2018 **Consulting Engineer**, Jones|Carter Engineering (now Quiddity Engineering), Department of Hydrology & Hydraulics, Houston, TX

2014-2016 **Research Fellow**, University of Texas at Austin, Center for Water & the Environment, Austin, TX

2014 **Program Manager**, City of Houston Public Works, Department of Stormwater Engineering, Houston, TX

2013 **Construction Manager**, AECOM International Services, Department of International Development, stationed in Takoradi, Ghana

2011-2014 **Graduate Engineer**, AECOM Technical Services, Department of Community Infrastructure, Houston, TX

2010-2011 **Research Assistant**, Texas A&M University, Department of Ocean Engineering, College Station, TX

## **GRANTS & AWARDS**

### **National Science Foundation (NSF) Fellowships**

2022-2023	<b>NSF Earth Sciences Postdoctoral Fellowship (NSF EAR-PF)</b> Solicitation 18-565. Award ID 2052598. PI: Castro, C.V.	\$174,000
	Title: “Green infrastructure scaling from local observations to regional applications as a coupled human-water system.” One of 12 awards within NSF Earth Sciences program. Sole award within Division of Hydrologic Sciences.	
2019-2020	<b>NSF Internship Supplemental Funding (NSF INTERN)</b> Solicitation 18-102. Award ID 1934192. Co-author with PI Rifai, H.S.	\$55,000
	Title: “Enhancing flood resilience through academic-governmental partnerships.” Supplemental funding to select NSF GRFP Fellows for experiential learning through research-focused internships with governmental agencies.	
2014-2019	<b>NSF Graduate Research Fellowship Program (NSF GRFP)</b> Solicitation 13-085. Award ID 2013162199. PI: Castro, C.V.	\$142,000
	Title: “Flood and landslide risk analysis using LiDAR imagery.” One of 22 awards within civil engineering field of study.	

### **Additional Awards, Fellowships, & Grants**

2022	Frontiers in Hydrology Meeting Early Career Travel Grant	\$1,000
2021	Cullen Graduate Fellowship Travel Grant	\$750
2021	American Geophysical Union Student Travel Grant	\$1,000
2021	Cullen Graduate Student Success Fellowship	\$500
2019-2022	Crawford and Hattie Jackson Foundation Fellowship (x3)	\$15,000
2019-2022	American Water Works Association Award, Texas Division (x3)	\$6,000
2019-2020	Union Plus Firefighter Scholarship	\$1,000
2019-2020	University of Houston Future Faculty Fellowship	\$3,000
2019-2020	CHI University Award for 2D PC-SWMM Hydraulic Model	\$2,000
2018-2019	American Water Works Association Award, Southeast Chapter (x3)	\$1,750
2018-2019	University of Houston President’s Endowed Scholarship	\$4,000
2018-2021	University of Houston Graduate Tuition Fellowship	\$42,000
2014-2016	University of Texas Thrust Endowed Fellowship	\$18,000
2010-2011	Chi Epsilon National Honor Society, President	
2010-2011	Texas A&M President’s Scholar Academic Excellence Award	\$1,500
2010-2011	Judy K. and Donald Ray ’68 Scholarship	\$4,000
2009-2010	Texas A&M Study Abroad Scholarship, Katholieke Universiteit, Belgium	\$6,000
2009-2011	Texas A&M Civil Engineering Scholarship (x2)	\$4,000
2009-2011	Texas A&M Academic Achievement Award (x2)	\$6,000
2009-2010	British Petroleum, Barnes & Noble, and Dean McCorkle Scholarships	\$3,000
2007-2008	Texas A&M Industrial Engineering Achievement Scholarship	\$1,000
2007	National Merit Scholar	

**TOTAL AWARDED FUNDING: \$492,500**

## **PUBLICATIONS**

### **Peer-Reviewed Journal Articles, Accepted**

- 2022      **Castro, C.V.** Systems-thinking for environmental policy coherence: Stakeholder knowledge, fuzzy logic, and causal reasoning. *Environmental Science & Policy*, 136. doi: [10.1016/j.envsci.2022.07.001](https://doi.org/10.1016/j.envsci.2022.07.001).
- 2022      **Castro, C.V.** Optimizing nature-based solutions by combining social equity, hydro-environmental performance, and economic costs through a novel Gini coefficient. *Journal of Hydrology X*, 100127. doi: [10.1016/j.hydroa.2022.100127](https://doi.org/10.1016/j.hydroa.2022.100127).
- 2022      Pande, S., Haeffner, M., Blöschl, G., Alam, F., **Castro, C.V.**, Di Baldassarre, G., Elshorbagy, A., Frick-Trzebitzky, F., Hogeboom, R., Kreibich, H., Mukherjee, J., Mukherji, A., Nardi, F., Nüesser, M., Tian, F., van Oel, P., Sivapalan, M. Never ask for a lighter rain but a stronger umbrella. *Frontiers in Water*, 204. (\*Perspective article). doi: [10.3389/frym.2014.00005](https://doi.org/10.3389/frym.2014.00005).
- 2021      **Castro, C.V.** and Rifai, H. S. Development and assessment of a web-based national spatial data infrastructure for nature-based solutions and their social, hydrological, ecological, and environmental co-benefits. *Sustainability*, 13(19): 11018. doi: [10.3390/su131911018](https://doi.org/10.3390/su131911018).
- 2020      **Castro, C.V.** and Maidment, D. R. HMS-PrePro: A GIS preprocessing tool for rapid initialization of HEC-HMS basin models. *Environmental Modelling & Software*, 130: 104732. doi: [10.1016/j.envsoft.2020.104732](https://doi.org/10.1016/j.envsoft.2020.104732).

### **Book Chapters, Accepted/Forthcoming**

- 2023      **Castro, C.V.** Penny, G., Gunda T., Montanari, A., Polo Gomez, M.J. (lead-authors) [+ 75 co-authors] *Panta Rhei Case Studies*, Chapter 11 in: Tian, F., Wei., J., Sivapalan, M., Blöschl, G. (Eds.) *Coevolution and prediction of coupled human-water systems: A synthesis of change in hydrology and society*, Cambridge University Press (07/01/2023).
- 2023      Viglione, A., Mukherjee, J., Archfield, S., **Castro, C.V.**, Hirabayashi, Y., Lafaye de Micheaux, F., Leong, C., Mazzoleni, M., Merz, B., Nakamura, S., Nardi, F., Rusca, M., Szolgay, J., Yan, H. *Human-Flood Systems*, Chapter 6 in Tian, F., Wei., J., Sivapalan, M., Blöschl, G. (Eds.) *Coevolution and prediction of coupled human-water systems: A synthesis of change in hydrology and society*, Cambridge University Press (07/01/2023).
- 2023      **Castro, C.V.** and Rifai, H.S. Gulf Coast Rivers of the Southwestern United States: Trinity River, San Jacinto River, Neches River, Chapter 5 in: Delong, M.D., Jardine, T.D., Benke, A.C., and Cushing, C.E. (Eds.) *Rivers of North America*, 2nd Edition. Academic Press (01/01/2023). ISBN 978-0128188484.

## Journal Articles, In-Review/Preparation

- 2022 – **Castro, C.V.**, Carney, C., de Brito, M.M. Elucidating power dynamics and complex thinking in natural resources management using graph theory. To submit to: *Frontiers in Water*.
- 2022 – Kreibich, H., Cudennac, C., Montanari, A., de Brito, M.M., Addor, N., Aghakouchak, N.A., Ambjerg-Neilsen, K., di Baldassarre, G., Muller, M., Viglione, A., Finger, D., Aksoy, H., Pande, S., **Castro, C.V.**, Wei, Y., Arheimer, B., Kruger, T., McMillan, H., Liu, H., Tian, F., Mendindo, M., Sivapalan, M. A review of Panta Rhei research on changes in hydrology and society. To submit to: *Hydrological Sciences Journal*.
- 2021 – **Castro, C.V.** and Rifai, H. S. Holistic planning of human, water, and environmental impacts for regional flood management: A case study of aging dam infrastructure. In review by: *Natural Hazards and Earth System Sciences*.
- 2021 – Penny, G., Gunda, T., **Castro, C.V.** Socio-hydrology: A decadal reflection and vision for the future. To submit to: *Hydrological Processes*.

## Media Articles

- 2021 **Castro, C.V.** “HMS-PrePro: An automated GIS toolbox for extracting cloud-based data, delineating watersheds, and calculating hydrological parameters.” Esri ArcGIS Water Blog, Mar. 23.
- 2016 **Castro, C.V.** “The Living Atlas can provide better access to data for hydrologic modeling. Esri ArcUser, Spring 2016, pp 32-35.

## Open-source Products

- 2021 **Castro, C.V.** “NBS-Geo: National spatial data infrastructure system for nature-based solutions.” doi: 10.4211/hs.3f9f741ef6f54cb19c78d3d858e643b2.
- 2019 **Castro, C.V.** “HMS-PrePro: ArcGIS geo-processing tool for rapid derivation of HEC-HMS hydrological basin models using cloud-based datasets and semi-automated spatial analyses.” doi: 10.5281/zenodo.3662765.

## TEACHING EXPERIENCE

### Co-Instructor

- U. of Illinois, CEE 450: Surface Hydrology (undergraduate) Fa. 2022  
U. of Illinois, CEE 554: Hydrologic Variability (graduate) Sp. 2022

### Guest Lecturer

- U. of Connecticut, NRE 3125: Watershed Hydrology (undergraduate) Fa. 2022  
U. of Texas, CEE 394K: GIS in Water Resources (graduate) Sp. 2015  
U. of Texas, CEE 398: Flood Forecasting (graduate) Sp. 2015

## Teaching Certifications & Trainings

NSF Center for Integration of Research, Teaching, & Learning (CIRTL) Associate-level Certification 2021

University of Houston Future Faculty Program (FFP) Traineeship 2018-2019

## Community Mentoring

2021-2022 Texas American Water Works Association, Professional Mentor  
2019-2020 City of Houston's Hire Houston Youth Program, Professional Mentor  
2017-2018 Jones|Carter University Workshop, Lecturer for Professional Engr. (PE) Exam  
2017-2018 TestMasters PE Prep, Design of Hydrology Course Syllabi & Lectures  
2017-2018 MathCounts Competition Series: Texas Society of Professional Engineers, Mentor  
2012-2014 Rice University Engineers Without Borders Student Chapter, Professional Mentor  
2011-2014 Architecture, Construction, Engineering (ACE) Mentor Program, Team Mentor  
2010-2011 Save Our Streets Youth Program, Community Mentor  
2009-2011 Society of Women Engineers Reading & Writing Lab, Student Mentor  
2009-2010 Texas A&M Center for Student-Athlete Services, Individual/Group Tutor in STEM

## PRESENTATIONS

### National & International Conferences

2022 **Castro, C.V.**, Pande, S., Haeffner, M., Blöschl, G., Alam, M., Di Baldassarre, G., Frick-Trzebitzky, F., Hogeboom, R., Kreibich, H., Mukherjee, J., Mukherji, A., Nardi, F., Nüsser, M., Tian, F., van Oel, P., Sivapalan, M. "Addressing societal interactions amidst water systems through the lens of Panta Rhei." *AGU Frontiers in Hydrology Meeting*, San Juan, Puerto Rico, Jun. 24.

2022 **Castro, C.V.** "A novel web-based national spatial data infrastructure for dynamic mapping of complex functionalities associated with nature-based solutions." *AGU Frontiers in Hydrology Meeting*, San Juan, Puerto, Rico, Jun. 21.

2022 de Brito, M.M., **Castro, C.V.**, Carney, C., Malard-Adam, J. "Elucidating complex-thinking and power dynamics in natural resources management." *AGU Frontiers in Hydrology Meeting*, San Juan, Puerto Rico, Jun. 20.

2022 **Castro, C.V.** "Balancing policy coherence in socio-hydrology." *International Association of Hydrological Sciences Assembly*, Montpellier, France, Jun. 3.

2022 **Castro, C.V.** "Water resources management as a coupled hydro-environmental and social-equity-based optimization framework." *International Association of Hydrological Sciences Assembly*, Montpellier, France, Jun. 1.

2022 Shafiei, M., Gharari, S., Gharesifard, M., Ghoreishi, M., **Castro, C.V.** "Sustainability Assessment: The role of Indicator-based Frameworks in Sustainable Water Management." *International Association of Hydrological Sciences Scientific Assembly*, Montpellier, France, Jun. 1.

- 2022 **Castro, C.V.**, Montanari, A., Penny, G., Gunda, T., Polo, M.J. “Panta Rhei: A decadal review of cause-effect pathways from global case studies.” *International Association of Hydrological Sciences Assembly*, Montpellier, France, May 30.
- 2022 Polo, M.J., **Castro, C.V.**, Penny, G., Gunda, T., Montanari, A. “Contribution of local examples of co-evolution of society and hydrology to address current and future challenges of sustainability in the context of the Panta Rhei book.” *European Geological Union (EGU) General Assembly*, Vienna, Austria, May 26.
- 2021 **Castro, C.V.**, Penny, G., Gunda, T., Montanari, A., Polo, M.J. “A decadal reflection of case studies encompassing the Panta Rhei paradigm.” *AGU Fall Conference*, New Orleans, LA, Dec. 17.
- 2021 **Castro, C.V.** and Rifai, H.S. “Decision-making for nature-based solutions through a user-friendly and holistic web-app.” Science to Action, *AGU Fall Conference*, New Orleans, LA, Dec. 14. (Poster)\*
- 2021 **Castro, C.V.** “Institutional and societal feedbacks and influences regarding nature-based solution implementation.” *Delft Conference on Socio-Hydrology*, Delft University of Technology, Netherlands, Sept. 7.
- 2021 Viglione, A., Mukherjee, J., Annis, A., Archfield, S., **Castro, C.V.**, Hirabayashi, Y., Hollermann, B., Lafaye de Micheaux, F., Carmen Llasat, M., Mazzoleni, M., Merz, B., Nakamura, S., Nardi, F., Rusca, M., Yan, H. “Human-flood systems: A multi-disciplinary perspective.” *Delft Conference on Socio-Hydrology*, Delft University of Technology, Netherlands, Sept. 7.
- 2021 Penny, G., **Castro, C.V.**, Gunda, T., Montanari, A., Polo Gómez, M.J. “A decadal review of cause-effect pathways from global case studies of human-water systems.” *Delft Conference on Socio-Hydrology*, Delft University of Technology, Netherlands, Sept. 7.
- 2020 **Castro, C.V.** “The levee effect and socio-hydrological adaptation.” *Women in STEM Symposium*, University of Chicago, Chicago, IL, Mar. 10.
- 2019 **Castro, C.V.** “Hydrological, societal, and environmental impacts of flood control reservoir releases on downstream communities using remote sensing and modeling during Hurricane Harvey.” *AGU Fall Conference*, San Francisco, CA, Dec. 9. (Poster)
- 2017 **Castro, C.V.** “Public geospatial data sourcing and processing for watershed analyses.” *Texas Floodplain Management Administration (TFMA) Annual Conference*, Austin, TX, Jul. 31.
- 2016 **Castro, C.V.** “A GIS framework for gathering data and preparing HEC-HMS basins.” *Texas Natural Resources Information System (TNRIS) GeoRodeo Conference*, Austin, TX, Oct. 27.

- 2016 **Castro, C.V.** “Living Atlas of the World provides data services for hydrologic modeling.” *Esri ArcGIS Water Conference*, Austin, TX, Feb. 10.
- 2015 **Castro, C.V.** “Performance assessment of WFDEI satellite data for estimating global rainfall intensity.” *Global Flood Partnership Annual Conference*, National Center for Atmospheric Research (NCAR), Boulder, CO, May 5. (Poster)\*

### **Departmental Presentations**

- 2022 **Castro, C.V.** “Exploring nature-based solutions as a network: Power dynamics and collective action.” *Water Resources Engineering Seminar*, Department of Civil Engineering, University of Illinois at Urbana-Champaign, Apr. 15.
- 2019 **Castro, C.V.** and Kiaghadi, A. “Urbanization challenges and solutions in public policy, engineering, and academic research.” *Houston Honors Early Research Experience*, University of Houston, Houston, TX, Feb. 26.
- 2015 **Castro, C.V.** “Geospatial framework for the National Flood Interoperability Experiment.” *Departmental Seminar for Civil, Environmental, & Architectural Engineering*, University of Texas at Austin, Austin, TX, Apr. 3.
- 2014 **Castro, C.V.** “Unified Methods for GIS-based Hydrological Modeling.” *Departmental Seminar for Civil, Environmental, & Architectural Engineering*, University of Texas at Austin, Austin, TX.

### **Community Outreach Presentations**

- 2018 **Castro, C.V.** “Natural disaster response and preparation with citizen science.” *Taste of Science*, Houston, TX, Apr. 24.
- 2017 **Castro, C.V.** “Girls in STEM: A Day in the Life.” *Girls in STEM: Empowered and Motivated to Succeed*, Klein Intermediate, Klein, TX, Nov. 4.
- 2017 **Castro, C.V.** “The Future of Flooding.” *TEDx*, Sugar Land, TX, Sept. 30.
- 2014 **Castro, C.V.** “Derivation of hydraulic and hydrologic guidelines for Jeddah, Saudi Arabia.” *American Society of Civil Engineering*, Texas A&M, Jan. 15.
- 2011 **Castro, C.V.** “Integrating urban growth, land development, and stormwater master planning in a metropolis.” *American Society of Civil Engineering*, Texas A&M University at College Station, Oct. 19.

### **Stakeholder Engagement Presentations**

- 2022 **Castro, C.V.** “Equity tools in sustainable resources management: Defining strategy, policy, and equity at the watershed-scale.” *City of Houston Office of Sustainability*, Feb. 8.
- 2022 **Castro, C.V.** “Advancing social equity in regional planning of urban green infrastructure.” *San Francisco Estuary Institute*, Jul. 8.

- 2021 **Castro, C.V.** “Development framework for prioritizing and decision-making of sustainable infrastructure.” *National League of Cities*, May 14.
- 2018 **Castro, C.V.** “Insights into stormwater and drainage impacts after multiple 500-year events.” *Harris County Flood Control District*, Houston, TX, May 23.
- 2018 **Castro, C.V.** “Reflecting on Hurricane Harvey: Human-water interactions and future impacts.” *Houston Energy Corridor District*, Houston, TX, Jan. 12.
- 2017 **Castro, C.V.** “Regional stormwater detention and environmental mitigation for native vegetation and natural habitats.” *City of Houston Public Works*, Apr. 19.
- 2016 **Castro, C.V.** “ArcGIS preprocessing for extracting geospatial data from cloud-based repositories.” *Lower Colorado River Authority*, Austin, TX, Mar. 10.
- 2015 **Castro, C.V.** “Federal floodplain mapping: Trending toward data as a service.” *City of Austin Public Works*, Austin, TX, Dec. 14.

### **WORKSHOPS & SYMPOSIUMS**

- 2020 Houston-area Drainage Taskforce Facilitator for Green Infrastructure
- 2019 City of Houston Resilient Cities Collaboration Workshop Participant
- 2019 Greater Houston Flood Mitigation Symposium Participant
- 2019 Houston-regional Geographic Information System Expo Participant
- 2018 NSF in Transition: User-Inspired Research in the Geosciences Participant
- 2018 Houston Engagement and Recovery Effort Symposium Participant
- 2018 University of Houston, Innovative Teaching and Learning at a Distance
- 2018 Rice SSPEED Urban Floods & Infrastructure, Moving Forward from Harvey
- 2017 Jones|Carter University, Workshop Facilitator for AutoCAD Civil 3D
- 2017 Jones|Carter University, Workshop Facilitator for ArcGIS Spatial Analysis
- 2016 Esri User Conference, ArcHydro Technical Workshop

### **SERVICE ACTIVITIES**

#### **Service to the Profession**

- 2022-2023 Committee Member, American Geophysical Union (AGU)  
Hydrology Section Student Subcommittee (H3S)
- 2022 Session Convener/Co-Convener, AGU Frontiers in Hydrology Meeting (FIHM), San Juan, Puerto Rico. “Bridging Resolutions Series”, Sessions: 109, 123, 134, 135, 143, 147, 151, 213, 151, 306, 307, 415, 439.
- Hydrological Phenomena & Human Behavior (Chair)
  - Sustainable Solutions & Policy-Making (Chair)
  - Natural Hazards & Civilization
  - Place-Based Equity & Justice
  - Water Security & Justice



- 2021 Session Convener/Co-Convener, AGU Fall Meeting, New Orleans, LA.  
 “Socio-hydrology Series”, Sessions: SY35A, SY52A, SY54A, SY55D.  
 – Integrating Complex Dynamics & Broadening Social Impacts (Chair)
- 2021 Working Group Participant, Citizens and Hydrology (CANDHY) for  
 International Association of Hydrological Sciences (IAHS)
- 2020-2021 Committee Member, Texas American Water Works Association (TAWWA)  
 Southeast Texas Chapter: Diversity and Inclusion Subcommittee

### Peer Review

- Journals: Journal of Hydrology, Hydrology & Earth System Sciences,  
 Geocarto International, Geoscientific Model Development,  
 Journal of Mountain Science
- Grants: Sigma Xi Research Honor Society Grants  
 National Academies of Sciences Gulf Research Program Proposals

Publons Reviewer ID: AAY-8693-2020

### International Outreach

- 2018 *Respire Haiti, Gressier, Haiti*  
 Organizer and team leader for supporting various initiatives for education,  
 nutrition, development, and medical needs in local community.
- 2017-2018 *Inter-American Development Bank (IADB), Limonade, Haiti*  
 Drainage modeling for bridge and culvert design in flood-prone region, using tool  
 developed in graduate school.
- 2017 *Engineering Ministries International, Ludhiana, India*  
 Civil engineering design for aging medical college & hospital, including drainage  
 analysis, sanitary sewer design, water supply, and site surveying.
- 2014-2015 *Road to Mafraq, Inc., Mafraq, Jordan*  
 Board member of 501c organization for expanding K-12 educational access within  
 displacement settlements of Syrian refugees.
- 2013-2014 *United Nations High Commissioner for Refugees (UNHCR), Takoradi, Ghana*  
 Volunteer civil engineering consultant for water, sanitation, grading, and electrical  
 needs within displacement settlement of Cote d’Ivoire refugees.
- 2013 *Living Water International, Leon, Nicaragua*  
 Installation, funding, training, and community partnership for various water wells  
 and sanitation services.

- 2011-2013 *Engineers Without Borders, San Salvador, El Salvador*  
Professional mentor and design engineer for potable water supply system, sanitary water treatment system, and mitigation of various local wells.
- 2012 *Children's Educational Center, Gonaives, Haiti*  
Installation and funding of two water wells for orphanage, including community partnerships toward improved economic conditions.
- 2011 *Disaster Response Team, Carrefour, Haiti*  
Disaster mitigation specialist, on-call for various NGOs following Haiti earthquake, including clean-up, logistics, water access, and sanitation.
- 2010 *Water Purification, Lusaka, Zambia*  
Initiated local partnerships with various community leaders for low-cost water treatment devices throughout region.

## **NON-ACADEMIC REPORTS & CONTRIBUTIONS**

### **Jones|Carter Engineering**

- 2018 *Shepherd & Durham Drive Reconstruction*  
Memorial Heights Redevelopment Authority & City of Houston  
  
Drainage modeling and civil engineering design services for transforming two high-risk roadways into a corridor of protected bike lanes, urban green infrastructure, pedestrian pathways, and optimized traffic signaling.
- 2017-2018 *Buffalo Bayou Park & Streambank Rehabilitation*  
Harris County Flood Control District (HCFCD) & City of Houston  
  
Earthen channel slope stabilization, sediment transport improvement, and park trail repairs following major storm damage. Involved geodetic surveying and earthwork analysis of cut/fill design using AutoCAD Civil 3D to latest industry standards.
- 2017-2018 *Conveyance Analysis for Addicks & Barker Reservoirs*  
Houston Energy Corridor District  
  
Stability and conveyance analysis for channel improvements and structural floodwalls to mitigate emergency releases from regional reservoirs. Included high-resolution precipitation analysis, overland flow routing, channel hydraulics, field measurements, and reservoir routing at outlet gates and spillways.
- 2017-2018 *Houston Avenue & White Oak Drive Reconstruction*  
City of Houston Department of Public Works  
  
Drainage analysis and design of roadway geometrics, pavement, and subsurface utilities for major street rehabilitation within 100-YR flood zone.

- 2017 *Letters of Map Revisions & Amendments*  
Federal Emergency Management Association (FEMA)  
High-resolution hydraulic mapping of federal floodplain with revised hazard modeling and delineation to modify effective floodway zones and elevations.
- 2016-2018 *Hazard Mitigation for Regional Flood Control Systems*  
City of Houston & FEMA  
Acquired and managed FEMA disaster funds to mitigate various stormwater infrastructures after a series of major storm events. Designs included various emergency weirs, detention ponds, and channel rehabilitation throughout region.
- 2016-2018 *Rehabilitation of Large-scale Earthen Detention Ponds*  
City of Houston Department of Maintenance  
Repair of three regional ponds that had overgrown and were no longer draining. Involved significant coordination with environmental agencies for habitat and endangered species protection. Utilized native riparian vegetation for slope stability and provided concrete pathways for improved maintenance access. Obtained and analyzed various geotechnical borings for slope design.
- 2016 *Interstate 635 Expansion - Bridge Hydraulics of Grapevine Creek*  
Texas Department of Transportation (TxDOT)  
Drainage modeling and bridge pier design for roadway expansion, including scour analysis, high chord elevation, riprap stabilization, and environmental assessment.
- 2016 *Colorado Riverbank Stabilization*  
Hyatt Lost Pines Resort & United States Army Corps of Engineers (USACE)  
Bank stabilization using a combination of steel sheet piles, gabion baskets, and earthen stabilization with high-performance textiles and engineered anchors. Established native vegetation for slope stability, water quality, and wildlife habitat.

### **AECOM Technical Services**

- 2014 *Local Drainage Program Manager*  
City of Houston Department of Stormwater Engineering  
Program manager for various small-scale erosion control and drainage repair projects throughout Houston, from conceptualization through construction. Ensured consultants met local regulation requirements by providing peer reviews and managing contracts, cost estimates, and schedules for 30+ design firms.
- 2014 *24-Inch Large Diameter Water Line*  
San Jacinto River Authority  
Engineering design, plans, and specifications for pressurized water transmission system, including pump stations, storage tanks, pipelines, and utility operations.

- 2013 *Highway US-59 Roadway Expansion in Rosenberg*  
Texas Department of Transportation (TxDOT)
- Hydrologic and hydraulic modeling drainage analysis and construction plan design, specifications, and cost estimates for state highway expansion, including design of bridge culverts, median detention storage units, stormwater pipes, and inlets.
- 2013-2014 *Buffalo Bayou Park Revitalization*  
Buffalo Bayou Park Partnership & HCFCFCD
- Civil design for revitalization of natural stream into community recreational resource and urban park. Included bank stabilization, bike and jogging trails, pedestrian bridges, lighting systems, native landscaping, and public art installation.
- 2013-2014 *Western Corridor Gas Infrastructure Development Project*  
Ghana National Gas Company
- Construction management for natural gas processing facility, incl. procurement, quality assurance, contract services, and environmental risk management.
- 2012-2013 *Buffalo Bayou Bank Stabilization*  
Houston Country Club
- Mitigation of slope stability using engineered earthen channelization techniques (e.g., gabion baskets, native vegetation, coconut fiber reinforcements), which was the first “green-wall” project in the state of Texas. Included geotechnical field reconnaissance, fluvial geomorphological analysis, civil site design, and construction coordination with USACE regarding upstream reservoir releases.
- 2012-2013 *Rice University George R. Brown Tennis Center*  
City of Houston & Rice University
- Site development using green stormwater infrastructure toward LEED-Silver certification of new campus sporting facility. Included collection of land survey data and conversion into topographic maps using computer-aided-design systems.
- 2011-2012 *Urban Stormwater Drainage Masterplan*  
Kingdom of Jeddah, Saudi Arabia
- Masterplan stormwater modeling and construction plan design for community with flash flooding and limited drainage infrastructure. Gathered and processed LiDAR; digitized subsurface utilities; derived novel drainage design standards; performed large-scale hydrologic/hydraulic modeling; designed construction plan sets.
- 2011 *Cinco Ranch Land Development*  
City of Houston Department of Public Works
- Site development designs for various neighborhood tracts in local subdivision, including grading, roadway layout, utilities, and construction phase services. Project cost estimates, including labor, materials, equipment, and scheduling.

## **PROFESSIONAL ASSOCIATIONS & LICENSURES**

2021 –	Member, International Association of Hydrological Sciences
2020	Hines Student Competition Participant, Urban Land Institute
2019 –	Member & Committee Member, American Geophysical Union
2018-2022	Member & Committee Member, Texas American Water Works Association
2016 –	Professional Engineer, Texas Board of Professional Engineers, License No. 123286
2016-2018	Certified Floodplain Manager, Texas Floodplain Management Association, License No. 2977-16N
2012-2014	LEED Green Associate, U.S. Green Building Council
2009-2014	Communications Officer, Engineers Without Borders Texas A&M Student Chapter & Houston Professional Chapter
2009-2011	Member, American Water Resources Association
2008-2011	Member, Society of Women Engineers
2008-2018	Member, American Society of Civil Engineers

## **TECHNICAL EXPERTISE**

Air Quality	EPA Co-benefits Risk Assessment (COBRA), EPA Avoided Emissions & Generation Tool (AVERT)
Computer-Aided-Drafting	AutoDesk AutoCAD / Civil 3D Bentley Microstation
Geographic Systems	ArcGIS Desktop / Pro / Online ArcPy (Python) Coding, ArcHydro Water Resources HEC-GeoHMS / HEC-GeoRAS Spatial Analysis Large Data Processing (i.e., ASCII, NetCDF, GRIB)
Hydraulics	USACE HEC-RAS 1D/2D, FHA HY-8 Culvert Analysis, TxDOT Winstorm Modeling, Bentley FlowMaster
Hydrology	USACE HEC-HMS, Soil and Water Assessment Tool (SWAT) Computational Hydraulics International PC-SWMM EPA Stormwater Management Model (SWMM) 5.0+ USGS Surface Water Data Analysis
Natural Hazards	Federal Emergency Management Association (FEMA) Hazus Disaster Risk Assessment Modeling (certified)
Remote Sensing	ENVI Geospatial Image Processing LiDAR Point Cloud Processing / Analysis GPS/UAV Georeferencing / Mapping / Modeling NWS Radar Precipitation Processing / Analysis
Water Distribution	Bentley OpenFlows WaterGEMS