

# CYNDI VAIL CASTRO, P.E.

*University of Illinois at Urbana-Champaign  
NSF Postdoctoral Fellow | Department of Civil & Environmental Engineering  
Department of Geography & Geographic Information Science*

## CONTACT

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1301 W Green St.,  
Urbana, IL 61801, USA

## RESEARCH

Nature-based solutions

Air-energy nexus

Watershed modeling

Human-water systems

Decision sciences

Sustainability governance

Geographic information  
systems science

Multi-criteria  
decision making

Systems-thinking

Fuzzy-cognitive mapping

Feedback loops

Environmental justice

Social equity

## REGISTRATIONS

Professional Engineer  
Texas No. 123286

Certified Floodplain Manager  
TFMA No. 2977-16N

LEED Green Associate

## EDUCATION

Ph.D., Civil & Environmental Engineering, University of Houston, 12/2021  
*Dissertation: "Nature-based Solutions at the Interface of Hydro-environmental Science, Social Justice, and Complex Decision-making"*

M.S., Civil Engineering, University of Texas – Austin, 05/2016  
*Thesis: "HMS-PrePro: A GIS preprocessing tool for extracting geospatial data and preparing HEC-HMS models"*

B.S., Civil Engineering, Texas A&M University – College Station, 05/2011  
Water Resources Engineering Track

## PROFESSIONAL APPOINTMENTS

2022-Present **University of Illinois at Urbana-Champaign**, Urbana, IL  
*NSF Postdoctoral Fellow  
Department of Civil & Environmental Engineering  
Department of Geography & Geographic Information Science*

Working with Prof. Murugesu Sivapalan on issues of watershed scaling, social equity, and human-water interactions through a novel lens of complexity science and network theory.

2019-2020 **City of Houston Mayoral Office**, Houston, Texas  
*NSF Intern | Department of Sustainability & Resilience*

Coordinated local policies pertaining to hurricane recovery, large-scale drainage infrastructure, social equity, and urban greening. Worked with various stakeholders from grassroots neighborhood organizations to federal and State agencies.

2015-2019 **Jones|Carter Engineering**, Austin, Texas & Houston, Texas  
*Civil Engineer & Project Manager  
Department of Hydrological & Hydraulic Sciences*

Professional engineer, project manager, and client manager for various multi-million (\$) projects throughout greater-Houston, including drainage channels, detention ponds, floodplain mapping, street rehabilitation, and urban site development.

## PROFESSIONAL APPOINTMENTS (cont'd)

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- 2014-2016 **University of Texas**, Austin, Texas  
*Graduate Research Fellow | Department of Civil Engineering*  
Lab member of Prof David Maidment's team at the Center for Research in Water Resources (CRWR). Developed various tools using Python coding and ArcGIS web-based data analytics for improved watershed modeling.
- 2014 **City of Houston**, Houston, Texas  
*Municipal Consulting Engineer | Department of Stormwater Engineering*  
Project manager for approximately 30 sub-consultants and numerous drainage projects throughout the greater-Houston area as an AECOM sub-consultant.
- 2013-2014 **AECOM Technical Services**, Ghana  
*Construction Manager*  
AECOM sub-consultant for construction of natural gas processing plant. Provided management of various international contractors and reported project progress to client (Ghana National Gas Company). Stationed in Takoradi, Ghana.
- 2011-2014 **AECOM Technical Services**, Houston, Texas  
*Graduate Civil Engineer | Department of Community Infrastructure*  
Engineer-in-training for various development projects, including large-scale watershed planning in Jeddah, Saudi Arabia, regional parks networks, green infrastructure projects, drainage modeling, floodplain mapping, and design of water plants, roadways, site development, channels, and sub-surface utilities.
- 2010-2011 **Texas A&M University**, College Station, Texas  
*Undergraduate Research Assistant | Department of Ocean Engineering*  
Research assistant for NSF CAREER Project to Prof. Scott Socolofsky. Conducted laboratory simulations of wave hydrodynamics and vegetation in constructed wetlands using particle image velocimetry (PIV) and acoustic Doppler radar.

## AWARDED RESEARCH FELLOWSHIPS

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- 2021-2022 **NSF Earth Sciences Postdoctoral Fellowship (EAR-PF)** \$174,000  
Principal Investigator (PI). NSF Solicitation No. 18-565. Award No. 2052598. "Green infrastructure scaling from local observations to regional applications as a coupled human-water system."
- 2019-2020 **NSF Non-academic Research Internship for Graduate Students (INTERN) Supplemental Funding** \$55,000  
Supplement for active NSF GRFP fellows. NSF Solicitation No. 18-102. Award No. 1934192. "Enhancing flood resilience strategies through academic-governmental partnerships." Awarded to PI Hanadi S. Rifai.
- 2014-2019 **NSF Graduate Research Fellowship Program (GRFP)** \$142,000  
Fellow. NSF Solicitation No. 13-085. Award No. 2013162199. "Flood and landslide risk analysis using LiDAR."

ϕ Perspective article.

3. ϕ 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., Nüsser, M., Tian, F., van Oel, P., Sivapalan, M. (2021). Never ask for a lighter rain but a stronger umbrella. *Frontiers in Water*, 204. doi: 10.3389/frwm.2014.00005.
2. **Castro, C.V.** and Rifai, H. S. (2021). 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.
1. **Castro, C.V.** and Maidment, D. R. (2020). HMS-PrePro: A GIS preprocessing tool for rapid initialization of HEC-HMS basin models. *Environmental Modelling & Software*, Vol 130, pp 104732. doi: 10.1016/j.envsoft.2020.104732.

#### Forthcoming Book Chapters (In-editing):

3. **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., and Benke, A.C. (Eds.) Rivers of North America, 2nd Edition. Elsevier. ISBN 978-0128188484. (Anticipated Publication: October 2022).
2. **Castro, C.V.**, Penny, G., Gunda T., Montanari, A., Polo, M.J. (Lead Authors). Medeiros, P., Carlos de Araújo, J., Sivapalan, M., Finger, D., Khatami, S., Kalantari, Z., Knighton, J., Guzman, C., Gustavo Allasia, D., Bulé, B.P., Rippel, E., Tassi, R., Gallo, N.F., Minella, J.P.G., Evrard, O., Kalin, L., De Barros, C.A.P., Ramon, R., Tiecher, T., Evers, M., Kyu Kyu, K., Htike, H., Taft, L., Almoradie, A., Züllich, M., Shanono, N.J., Nasidi, N.M., Ismail, H., Arumi, J.L., Muñoz, E., Dietrich, J., Delgado, V., Boll, J., Teweldebrihan, M.D., Lyu, H., Pande, S., McClain, M., Li, B., Conrad, L.M., Fernald, A.G., Huang, Y., Yu, S., Castilla-Rho, J., Xu, L., Famiglietti, J., Pomeroy, J.W., Civantos, J.M., Pistocchi, A., Ganora, D., Strasser, U., Morin, S., Persiano, S., Schmölz, K., Bertoldi, G., Pugliese, A., Tasser, E., Castellarin, A., Cavas, Y., Aksoy, H., Papacharalampous, G., Tyralis, H., Losada, M., Díez-Minguito, M., Contreras, E., Navarro, G., Ruiz-Segura, J., Rivera, D., Godoy, A., Boettiger, C., Oel, P., Odongo, V.O., Carmet Llasat, M., Jiménez, J.A., Hendricks, D., Solomon, D. 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. (Anticipated Publication: May 2023).
1. 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. (Anticipated Publication: May 2023).

### In-review / In-progress:

5. **Castro, C.V.**, Carney, C., Malard-Adam, J., de Brito, M.M. Elucidating complex-thinking and power dynamics in natural resources management. To submit to: *Frontiers in Water*, special issue for Delft Socio-hydrology Conference. (Writing In-progress).
4. Gunda, T., **Castro, C.V.**, Penny, G. Socio-hydrology: A decadal reflection and vision for the future. To submit to: *Water Security*. (Writing In-progress).
3. **Castro, C.V.** Optimizing nature-based solutions by combining social equity, hydro-environmental efficiency, and economic costs through a novel Gini coefficient. Submitted to: *Journal of Hydrology*. Preprint doi: 10.31223/X5HS68. (Minor Revisions, In-progress).
2. **Castro, C.V.** Holistic systems-thinking for policy coherence: A case study of socio-institutional challenges and opportunities for improved adoption of nature-based solutions. Submitted to: *Environmental Science & Policy*. Preprint doi: 10.31223/X5M32S. (In-review).
1. **Castro, C.V.** and Rifai, H. S. Integrating social, economic, and environmental risk into flood management of aging dam infrastructure by combining cost-benefit and multi-criteria decision analyses. Submitted to: *Natural Hazards and Earth System Sciences*. Preprint doi: 10.5194/nhess-2021-144. (Moderate Revisions, In-progress).

### **TEACHING EXPERIENCE**

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#### University of Houston:

- 2021 Associate-level STEM Teaching Certification  
Center for Integration of Research, Teaching, and Learning (CIRTL)
- 2018-2019 Future Faculty Fellowship (F3) Program Training  
Professional development training for student engagement, instruction, & assessment.

#### University of Texas:

- 2015 Guest Lecturer, CE 397 - Flood Forecasting
- 2014 Guest Lecturer, CE 394K.3 - GIS in Water Resources

#### Texas A&M University:

- 2009-2010 STEM Tutor, Texas A&M Center for Student-Athlete Services  
Individual tutor for student-athletes in various math and engineering courses.

### **PRESENTATIONS**

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#### National & International Conferences:

\* Poster presentation. † Presentation by co-author.

19. de Brito, M.M.<sup>†</sup>, **Castro, C.V.**, Carney, C., Malard-Adam, J. (2022). "Elucidating complex-thinking and power dynamics in natural resources management." *American Geophysical Union (AGU) Frontiers in Hydrology Meeting*, San Juan, Puerto Rico.
18. **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. (2022). “Addressing societal interactions amidst water systems through the lens of socio-hydrology.” *American Geophysical Union (AGU) Frontiers in Hydrology Meeting*, San Juan, Puerto Rico.
17. **Castro, C.V.** (2022). “IAHS2022-20, Balancing Policy Coherence in Socio-hydrology.” International Association of Hydrological Sciences (IAHS), *IAHS-AISH Scientific Assembly 2022, S7 – Grounded socio-hydrology*, Montpellier, France.
  16. **Castro, C.V.** (2022). “IAHS2022-257, Water resources management as a coupled hydro-environmental and social-equity-based optimization framework.” International Association of Hydrological Sciences (IAHS), *IAHS-AISH Scientific Assembly 2022, S4 – Water resource management in a changing world: economic, environmental and societal trade-offs and synergies*, Montpellier, France.
  15. Shafiei, M.<sup>†</sup>, Gharari, S., Gharesifard, M., Ghoreishi, M., **Castro, C.V.** (2022). “IAHS2022-271, Sustainability Assessment: The role of Indicator-based Frameworks in Sustainable Water Management.” International Association of Hydrological Sciences (IAHS), *IAHS-AISH Scientific Assembly 2022, S4 – Water resource management in a changing world: economic, environmental and societal trade-offs and synergies*, Montpellier, France.
  14. Montanari, A.<sup>†</sup>, **Castro, C.V.**, Penny, G., Gunda, T., Polo, M.J. (2022). “IAHS2022-573, Panta Rhei: A Decadal Review of Causa-effect Pathways from Global Case Studies.” International Association of Hydrological Sciences (IAHS), *IAHS-AISH Scientific Assembly 2022, S5 – A Synthesis of Change in Hydrology and Society: Coevolution and prediction of coupled human-water systems*, Montpellier, France.
  13. Polo, M.J.<sup>†</sup>, **Castro, C.V.**, Penny, G., Gunda, T., Montanari, A. (2022). “HS1.1.4, 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 General Assembly*, Vienna, Austria.
  12. **Castro, C.V.**, Penny, G., Gunda, T., Montanari, A., Polo, M.J. (2021). “H51F-04, Panta Rhei: Hydrology, Society, and Environmental Change: A decadal reflection of case studies encompassing the Panta Rhei paradigm.” *American Geophysical Union Fall Conference*, New Orleans, Louisiana.
  - 11.\* **Castro, C.V.** and Rifai, H.S. (2021). “SY25E-0619, Decision-making for nature-based solutions through a user-friendly and holistic web-app.” *Science to Action: Enabling Water Resources Management Decisions Driven by Science and Data*, *American Geophysical Union Fall Conference*, New Orleans, Louisiana.
  10. **Castro, C.V.** (2021). “Institutional and societal feedbacks and influences regarding nature-based solution implementation.” *Delft Conference on Socio-hydrology, Theme 4 – Data mining and processing, social science surveying, human behavior experiments*. Delft University of Technology, Netherlands.
  9. Penny, G.<sup>†</sup>, **Castro, C.V.**, Gunda, T., Montanari, A., Polo Gómez, M.J. (2021). Panta Rhei: A decadal review of cause-effect pathways from global case studies. *Delft Conference on Socio-hydrology*. Delft University of Technology, Netherlands.
  8. Viglione, A.<sup>†</sup>, Mukherjee, J., Annis, A., Archfield, S., **Castro, C.V.**, Hirabayashi, Y., Hollermann, B., de Micheaux, F.L., Carmen Llasat, M., Mazzoleni, M., Merz, B., Nakamura, S., Nardi, F., Rusca, M., Yan, H. (2021). Panta Rhei Chapter 6: Human-Flood Systems. *Delft Conference on Socio-hydrology*. Delft UT, Netherlands.

7. **Castro, C.V.** (2020). The levee effect and socio-hydrological adaptation. *Women in STEM Symposium*. University of Chicago, Chicago, Illinois.
6. Rifai, H.S.<sup>†</sup> and **Castro, C.V.** (2020). “At the intersect of engineered systems for flood mitigation, society, and resiliency: the Harvey posed challenge in greater Houston.” Hurricane Resilience Research Institute (HuRRI) *HurriCon Conference: Science at the Intersection of Hurricanes and the Populated Coast*. East Carolina University, NC, USA.
- 5.\* **Castro, C.V.** (2019). “GH13C: Hydrological, societal, and environmental impacts of flood control reservoir releases on downstream communities using remote sensing and modeling during Hurricane Harvey.” *American Geophysical Union Fall Conference*, San Francisco, California.
4. **Castro, C.V.** (2017). “Public geospatial data sourcing and processing for watershed analyses.” *Texas Floodplain Management Administration Conference*, Austin, Texas.
3. **Castro, C.V.** (2016). “A GIS framework for gathering data and preparing HEC-HMS basins.” *Texas Natural Resources Information Systems GeoRodeo*, Austin, Texas.
2. **Castro, C.V.** (2016). “Living Atlas of the World provides data services for hydrologic modeling.” *Esri ArcGIS Water Conference*, Austin, Texas.
- 1.\* **Castro, C.V.** (2015). “Performance assessment of WFDEI satellite data for estimating global rainfall intensity.” (Poster & eLightning). *Global Flood Partnership Annual Conference*, National Center for Atmospheric Research (NCAR), Boulder, Colorado.

#### University Presentations

7. **Castro, C.V.** and Kiaghadi, A. (2020). “Urbanization Challenges & Solutions in Public Policy, Engineering, and Academic Research.” *University of Houston*, Houston Early Research Experience (HERE), Houston, Texas.
6. **Castro, C.V.** (2019). “Lessons Learned from Hurricane Harvey at the Intersection of Stormwater & Environmental Engineering.” *University of Houston*, Houston Scholars Program, Houston, Texas.
5. **Castro, C.V.** (2015). “National Flood Interoperability Experiment (NFIE) Geospatial Framework.” *University of Texas Department of Civil Engineering*, Departmental Seminar, Austin, Texas.
4. **Castro, C.V.** (2015). “Hydraulic Modeling Overview and Case Study of Onion Creek Floodplain.” *University of Texas Department of Civil Engineering*, Austin, Texas.
3. **Castro, C.V.** (2014). “Unified Methods for GIS-based Hydrological Modeling.” *University of Texas Department of Civil Engineering*, Departmental Seminar, Austin, Texas.
2. **Castro, C.V.** (2014). “Hydraulics and Hydrologic Largescale Modeling for City of Jeddah, Saudi Arabia.” *Texas A&M University*, American Society of Civil Engineering Meeting, College Station, Texas.
1. **Castro, C.V.** (2013). “Urban Design, Land Development, & Stormwater Masterplan.” *Texas A&M University*, American Society of Civil Engineering Meeting, College Station, Texas.

#### Community Outreach Presentations

5. **Castro, C.V.** (2018). “Natural Disaster Response and Preparation using Social-media and Citizen Science.” *Taste of Science Community Event*, Houston, Texas.

4. **Castro, C.V.** (2017). “The Future of Flooding.” **TEDx** Sugar Land, Texas.
3. **Castro, C.V.** (2017). “Girls in STEM: A Day in the Life.” *Girls in STEM Education Outreach*, Klein, Texas.
2. **Castro, C.V.** (2016). “Hydraulic and Hydrologic Engineering and Modeling Frameworks and Best Practices.” Workshop. *Jones/Carter University Program*, Houston, Texas.
1. **Castro, C.V.** (2016). “AutoCAD Civil 3D Site Grading and Detention Ponds.” Workshop. *Jones/Carter University Program*, Houston, Texas.

#### Stakeholder Engagement Presentations

6. **Castro, C.V.** (2022). “Equity Tools in Sustainable Resource Management: Defining Strategy, Policy, and Equitable Approaches at the Watershed-scale.” *City of Houston Mayoral Department of Sustainability, Resilience, and Recovery*, Houston, Texas.
5. **Castro, C.V.** (2016). “ArcGIS Preprocessing for Extracting Geospatial Data from Cloud-based Repositories.” *Lower Colorado River Authority*, Austin, Texas.
4. **Castro, C.V.** (2016). “FEMA Floodplain Mapping: Trending toward Data as a Service.” *City of Austin Department of Public Works*, Austin, Texas.
3. **Castro, C.V.** (2018). “Insights into Stormwater and Drainage Impacts after Multiple 500-Year Events.” *Harris County Flood Control District*, Houston, Texas.
2. **Castro, C.V.** (2017). “Regional Stormwater Detention and Environmental Mitigation for Native Vegetative Species and Natural Habitats.” *City of Houston Department of Public Works*, Houston, Texas.
1. **Castro, C.V.** (2017). “Feasibility analysis of dental college civil engineering rehabilitation in Ludhiana, India.” *Jones/Carter Engineering Firm*, Houston, Texas.

#### SERVICE ACTIVITIES

2022-2023	<b>Committee Member:</b> AGU Hydrology Section Student Subcommittee (H3S)
2022	<b>Session Convener:</b> AGU Frontiers in Hydrology Meeting, San Juan, Puerto Rico. Primary Convener, Session Series: “Bridging resolutions in human-water science.” <ul style="list-style-type: none"> <li>- Convener / Chair: Sustainable Solutions &amp; Policymaking</li> <li>- Convener / Chair: Hydrological Phenomena &amp; Human Behavior</li> </ul>
2021	<b>IAHS Working Group:</b> Citizens and Hydrology (CANDHY) for International Association of Hydrological Sciences (IAHS), Working Group Participant
2021	<b>Session Convener:</b> AGU Fall Meeting, New Orleans, Louisiana, USA. “Socio-hydrology: Integrating complex dynamics and broadening social impacts.” <ul style="list-style-type: none"> <li>- Primary Convener / Chair: Session SY52A-I, Oral</li> <li>- Convener / Co-chair: Session SY35A-III, eLightning</li> <li>- Convener / Co-chair: Session SY55D-IV, Posters</li> <li>- Primary Convener / Liaison: SY55D, Student Presentation Awards</li> </ul>
2021	<b>Session Chair:</b> International Conference on Socio-hydrology, Delft, The Netherlands. Session 2, Theme 4.2: “New human-water datasets, algorithms, and analytical tools.”
2020-2021	<b>Committee Member:</b> Texas American Water Works Association (TAWWA), Southeast Texas Chapter, Diversity and Inclusion Committee

Peer Review:

**Journals**

- 2022 Geocarto International
- 2021 Geoscientific Model Development
- 2021 Journal of Hydrology
- 2020 Journal of Mountain Science

**Grants**

- 2022 National Science Foundation (NSF) Hydrologic Sciences Proposal
- 2020 Sigma Xi Grants-in-Aid of Research, Research Honor Society

**Conferences**

- 2021 AGU Fall Outstanding Student Presentation Awards (OSPA), Liaison
- 2020 AGU Fall Outstanding Student Presentation Awards (OSPA), Reviewer

Community Mentoring:

- 2021-2022 Texas American Water Works Association (TAWWA) Professional Mentor
- 2019-2020 City of Houston – Hire Houston Youth Program Mentor
- 2017-2018 MathCounts, Texas Society of Professional Engineers
- 2012-2014 Rice University Engineers Without Borders, Student Chapter Professional Mentor
- 2011-2014 Architecture, Construction, Engineering (ACE) Mentor Program of America
- 2011-2013 Star of Hope Homeless Shelter Volunteer
- 2010-2011 Save Our Streets Youth Community Mentor
- 2009-2011 Society of Women Engineers Elementary Reading & Writing Lab Volunteer

International Initiatives:

- 2018 **Respire Haiti**, Gressier, Haiti  
Team leader and trip coordinator to support community education and medical care.
- 2017-2018 **Intra-American Development Bank**, Gonaives, Haiti  
Drainage modeling for culvert design in flood-prone region.
- 2017 **Engineering Ministries International**, Ludhiana, India  
Team leader for civil engineering and surveying of aging medical college & hospital.
- 2014-2015 **Road to Mafraq, Inc.**, Mafraq, Jordan  
Board member for 501c organization to expand educational opportunities.
- 2013-2014 **United Nations High Commissioner for Refugees**, Takoradi, Ghana  
Provided local engineering assistance to UNHCR refugee camp leaders.
- 2013 **Living Water International**, Leon, Nicaragua  
Installed water wells and provided community training and education.
- 2011-2013 **Engineers Without Borders**, San Salvador, El Salvador  
Team leader and trip coordinator to support community education and medical care.  
Team leader for potable water system design and installation.  
Houston Professional Chapter. Traveled to site, gathered data, implemented design.



- 2012      **Children’s Educational Center**, Gonaives, Haiti  
Funded and coordinated installation of two water wells for children’s center.
- 2011      **Disaster Assistance Response Team**, Carrefour, Haiti  
Performed disaster response services and drainage remediation following earthquake.
- 2010      **Water Purification**, Lusaka, Zambia  
Worked with local engineers to employ low-cost water treatment devices.

### **AWARDS, HONORS, & SCHOLARSHIPS**

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2021	Cullen Graduate Fellowship Travel Grant	\$750
2021	American Geophysical Union (AGU) 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	Texas Section American Water Works Association (AWWA) (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	Southeast Texas Chapter AWWA Award	\$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
2012-2014	Engineers Without Borders Houston Professional Chapter, Officer	
2009-2011	Texas A&M Chi Epsilon National Honor Society, President	
2009-2010	Study Abroad Scholarship Katholieke Universiteit, Leuven, Belgium	\$6,000
2009-2010	Judy K. and Donald Ray ’68 Scholarship	\$1,000
2009-2010	British Petroleum American Scholarship	\$1,000
2007-2011	Texas A&M University President’s Endowed Scholarship	\$12,000
2007-2011	Texas A&M Academic Achievement Award	\$10,000
2007-2008	Industrial Engineering Endowed Scholarship	\$1,000
2008-2009	Barnes & Noble Merit Award	\$1,000
2008	Dean McCorkle Endowed Scholarship	\$1,000

### **TECHNICAL REPORTS & CONTRIBUTIONS**

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Note: For engineering designs and analyses, all materials are copyrighted to the primary engineer-of-record (EOR), denoted by \*. Technical products available by request.

14.      **Castro, C.V.\*** (2018). Field reconnaissance, geomorphological analysis, and three-dimensional bank stabilization for Hurricane Harvey stream damage. *Harris County Flood Control District & Federal Emergency Management Agency (FEMA)*.
13.      Landry, K.\* and **Castro, C.V.\*** (2018). Drainage analysis for major street rehabilitation within FEMA flood zone. Houston Avenue and White Oak Drive. *Memorial Heights Redevelopment Authority & City of Houston*. ID N-T05000.
12.      **Castro, C.V.\*** (2017). Flood reservoir stability and downstream conveyance analysis for channel improvements and structural floodwalls. U.S. Army Corps of Engineers’ Addicks & Barker Reservoirs. *Houston Energy Corridor District*.

11. **Castro, C.V.\*** (2017). Earthen channel slope stabilization and sediment transport improvement for major tributary following Hurricane Harvey damage. Buffalo Bayou Park bank improvements. *Harris County Flood Control District*. ID W100-00-00-X036.
10. **Castro, C.V.\*** (2017). FEMA hazard mitigation for regional detention pond and weir flood control system. *City of Houston, Spring Creek Utility District, & FEMA*. ID 17005056.
9. **Castro, C.V.\*** (2017). Nature-based solution stormwater detention basin rehabilitation of three regional ponds, including ecological investigation and environmental protection for endangered species. *City of Houston*. ID M-430296.
8. **Castro, C.V.\*** (2017). Revised flood hazard modeling and delineation to modify effective floodway zones and elevations for FEMA National Flood Insurance Program. *Federal Emergency Management Agency*.
7. **Castro, C.V.** and Haeber, J.\* (2016). Hydrologic and hydraulic analysis for new bridge highway over Grapevine Creek waterway of Interstate 635 in Dallas County, Texas. *Texas Department of Transportation*. ID 2374-07-063.
6. Williford, E.\* and **Castro, C.V.** (2013). Green infrastructure stormwater assessment for tennis court facility and site development at Rice University. *City of Houston & Rice University*.
5. **Castro, C.V.** (2013). Health, safety, and environmental protection analysis for natural gas infrastructure development in rural Ghana. *Ghana National Gas Limited Company*.
4. Williford, E.\* and **Castro, C.V.** (2012). Revitalization and transformation of natural stream into community recreational resource. Buffalo Bayou Park. *Harris County Flood Control District & Buffalo Bayou Park Partnership*. ID No. W100-00-00-X036.
3. Williford, E.\* and **Castro, C.V.** (2012). Comprehensive drainage analyses, street paving improvements, and sub-surface utility rehabilitations for various large neighborhoods in greater-Houston area. *City of Houston*. ID M-420126-0076.
2. Holder, A., Zeve, M.\*, Williford, E.\* and **Castro, C.V.** (2013). Hydrologic and hydraulic modeling drainage analysis and construction plan design for major highway expansion, US-59 in Rosenberg, Texas. *Texas Department of Transportation*.
1. **Castro C.V.** (2012). Urban stormwater drainage masterplan for 7 regional basins following fatal flash flooding, including large-scale LIDAR collection and processing, geospatial big data analytics, novel unit hydrograph development, integrated two-dimensional SWMM modeling, and computer aided drafting (CAD) of construction plans. *Kingdom of Jeddah, Saudi Arabia*. ID WER06-REP-0040-C.

### Media Articles:

2. Castro, C.V. (2021). HMS-PrePro: An automated GIS toolbox for extracting cloud-based data, delineating watersheds, and calculating hydrological parameters. Esri ArcGIS Water Blog. <https://tinyurl.com/HMSPreProEsri>
1. Castro, C.V. (2016). The Living Atlas can provide better access to data for hydrologic modeling. Esri ArcUser Article, Volume Spring 2016, pp 32-35. <https://tinyurl.com/LivingAtlasEsri>

### Open-source Products:



2. Castro, C.V. (2021). GeoNBS: Web-mapping application to explore and download seamless, authoritative, inter-disciplinary social, environmental, and hydrological datasets regarding nature-based solution planning. <https://tinyurl.com/nbsgeo>
1. Castro, C.V. (2019). HMS-PrePro 10.7.1: Global GIS processing tool for HEC-HMS hydrological basin models using cloud-based data and automated spatial analysis. Github Repository. <https://doi.org/10.5281/zenodo.3662765>

## **PROFESSIONAL AFFILIATIONS**

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American Geophysical Union (AGU)	Member
American Society of Civil Engineers (ASCE)	Former Member
American Water Works Association (AWWA)	Diversity & Inclusion Committee Member
Engineers Without Borders (EWB)	Houston Professional Chapter Officer
Texas Floodplain Mgmt. Association (TFMA)	<b>Floodplain Manager License No. 2977-16N</b>
Texas Board of Professional Engineers (TBPE)	<b>Professional Engineering License No. 123286</b>
Society of Women Engineers (SWE)	Former Member
United States Green Building Council (USGBC)	<b>LEED Green Associate Certification</b>
Urban Land Institute (ULI)	Hines Urban Land Use Competition Participant

## **TECHNICAL SKILLS**

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Air Quality Modeling:	EPA COBRA Program
Computer Coding:	Java, Python, Matlab, R, VBA
Energy Modeling:	EPA AVERT Program
Engineering Design:	AutoCAD, AutoCAD Civil 3D, Microstation
Geographic Systems:	Esri ArcGIS, ArcPy Coding, ArcHydro
Natural Hazards:	FEMA Hazus Program
Remote Sensing:	ENVI Geospatial
Water Distribution:	Bentley OpenFlows WaterGEMS
Watershed Modeling:	HEC-HMS, HEC-GeoHMS, HEC-RAS 1D/2D, HEC-GeoRAS, HY-8 Hydraulics, FlowMaster, Winstorm, SWAT, SWMM 2D