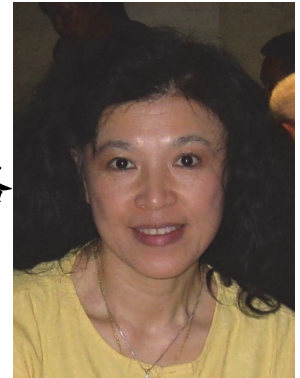


# 我走上了水利工程管理之路

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I am now known as Kathlie S. Jeng-Bulloch in the U.S., I am a 1979 graduate of Soochow University, Taiwan with a B.S. in Physics. I received my M.S. in Civil & Environmental Engineering from the University of Houston in 1982, and Ph. D. in Civil Engineering from the University of Houston in 2011.

I am now a Registered Professional Engineer in the State of Texas, a Certified Flood Plain Manager, and a Diplomate Water Resource Engineer. I have spent my entire professional career in technical, managerial and leadership positions with the City of Houston, Texas, Houston Public Works.

After I received my Master's degree, and had my first child, I started my career in 1985 with the City of Houston Public Works, Drinking Water Operations as a Graduate Engineer. During 1998 I became Chief Engineer in Drinking Water Operations responsible for Capital Projects, the Water Laboratory, the Water Quality Inspection Team, and the Lake Houston Patrol.

I served as Managing Engineer, Office of City Engineer, Houston Public Works, City of Houston, Texas for the past sixteen years. I was involved in establishment of the annual review cycle of the City of Houston Infrastructure Design Manual in 2004, and since then participate in the annual Design Manual update. As Managing Engineer, I manage a group of engineers, technicians and inspectors who perform the review and approval of all design projects in public ways/easements inside the Houston city limits, the extraterritorial jurisdiction (ETJ) and Developer Participation contract projects (approximately 3,400 projects per year). Water, wastewater, stormwater, stormwater quality, private utilities infrastructure, street and traffic are included in this review process.

I have worked with the American Council of Engineering Companies, Houston, (ACEC) to establish the allowable LID (Low Impact Development) techniques and assisted in adoption of these LID techniques into the City of Houston Infrastructure Design Manual in 2008.

I don't want to share with you the numerous experiences I have had in the past years. But I have to mention that I currently serve (since 2014) as one of two members who represent EWRI on the ASCE National Codes and Standards Committee. And I am a

member of Tau Beta Pi and Chi Epsilon, engineering honor societies. I am also active in the Association of Chinese American Professionals (ACAP), having served as Chair in 2011.

I shall describe briefly the challenges I have faced in recent years. The City of Houston and the Houston region experienced three catastrophic flooding events in three consecutive years:

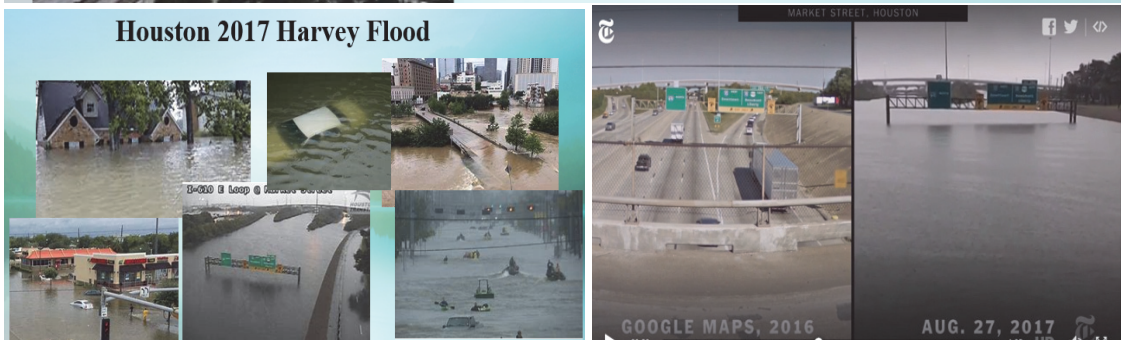
1. The Houston 2015 Memorial Day Flood with 12 inches rain falling on parts of Houston within 10 hours. Other parts of Houston received 11 inches of rainfall in less than 6 hours. During this Flood, over 96,000 home flooded and 7,300 Houstonians applied for disaster assistance from the Federal Emergency Management Agency (FEMA). Through the end of January 2016, Houstonians received \$ 177.5 million in disaster assistance.

Brays Bayou overflowed its banks, flooding the Southwest Wastewater Treatment Plant, and 100,000 gallons of wastewater spilled out on the 25<sup>th</sup> of May 2015.

2. The April 2016 Houston Tax day flood, with 17 inches of rain falling on Houston within 48 hours.
3. The 2017 Houston Hurricane Harvey Flood with between 30 inches and 50 inches of rainfall throughout portions of Houston, the Houston region and beyond. These events, in particular Harvey, resulted in billions of dollars of property and infrastructure damage inside the Houston city limits.

The Pictures below are from the Houston 1908, 2015 Memorial Day, 2016 Tax Day, and 2017 Harvey Floods.





Since the Harvey Flood, the Houston Council adopted revisions to the Code of Ordinances ( effective September 2018) to prevent more flooding in the future. This Ordinance revision above provides higher finished floor slab elevations for construction in the floodplain which could have protected more homes if in force prior to the Harvey Flood.

Three years after Hurricane Harvey, many residents have still not been able to move back into their homes in Houston, Texas, the fourth largest City in the United States. Harvey dumped up to 50 inches of rain in the Houston area over a four-day period after making landfall on August 25, 2017. Due to the storm 68 people died and it caused about

\$125 billion in damage in Texas. In the Houston area, Harvey flooded more than 150,000 homes.

Once the storm made landfall, it essentially stalled, turning roads in Houston and its surroundings into raging rivers. The City of Houston is 640 square miles in area, with 2.3 million residents, and 37,000 miles of infrastructure.

More than a trillion gallons of rain fell in Harris County alone, of which Houston is a part. 25 to 30% of Harris County's 1,800 square miles of land were flooded. This is enough water to run Niagara Falls for 15 days or fill the Houston Astrodome 3,200 times over.

The City of Houston Codes of Ordinance was revised during September 2018 to provide higher finished floor slab elevations for construction in the floodplain which could have protected more homes if in force prior to the Harvey flood.

The City of Houston Infrastructure Design Manual was also revised during September 2018 due to the Harvey Flood. The revision includes:

1. All development (new or redevelopment) shall not alter and/or block existing sheet flow.
2. No negative impact will be allowed onto adjacent private property.
3. More restrictive criteria shall govern.
4. No sheet flow from the developed property will be allowed to drain via sheet flow onto the adjacent Right of Way.
5. Eliminate detention credit for existing impervious cover.
6. Detention requirement limited to disturbed areas resulting in impervious surface.
7. Detention will not be required on only those single family detached residential lots with less than 15,000 square feet and having less than 65% impervious surface. If the proposed impervious surface is larger than 65%, the detention requirement will be 0.2 acre feet/acre multiply by surface over 65% disturbed area.
8. Property less than 1 acre and not in item #7, the detention requirement is 0.2 acre feet per acre multiply by disturbed area.
9. Property more than 1 acre, the detention requirement is 0.5 acre feet per acre multiply by disturbed area.

The results of these catastrophes were changes in City Infrastructure Design Standards, Building Policies and City Ordinances to ensure that the impact of future rainfall related catastrophes of this nature will be mitigated. These actions taken by the City will make its infrastructure more resilient.

On this special occasion of the 50<sup>th</sup> Anniversary of Soochow University Physics Department, I would like to share below with the undergraduate students:

Firstly, if you are interviewing for a job, be confident, as you are the most knowledgeable person in your field having just learned the most advanced methods through your classwork. 要有自信，也表現出自信。

Secondly, the degree you have just earned is your ticket to start your career, and now it is up to you to prove yourself on the job through hard work, respect for others, and being a good listener. If you don't hear clearly what others are saying, particularly your superiors, you will not succeed. 你若不傾聽他人，特別是你的上級時，你不會成功。

Thirdly, while you may work with many good people, the only person that is going to worry about you and your future is YOU. You must always be thinking about where you want to eventually be in your career in the future. NEVER LOSE SIGHT OF YOUR GOALS. 隨時要記得你的目標。

Finally, it is not only your aptitude, but also your attitude, that determines your altitude. 性向與態度決定你的高度。