

# The Department of Civil and Environmental Engineering at the University of Houston presents...

## CIVE 6111 Graduate Seminar

### Houston Harris Heat Action Team(H3AT): Using Community Science to Map Houston's Hot Spots



**Meredith Jennings, PhD, Research Associate**  
Community and Climate Resilience at HARC



**Ebrahim Eslami, PhD, Research Scientist**  
Air Quality at HARC

**Friday, October 21, 2022**  
2:45pm-3:45pm  
Classroom Business Building (CBB) - Room 104  
Zoom: [https://uh-edu-cougarnet.zoom.us/j/95702511696?](https://uh-edu-cougarnet.zoom.us/j/95702511696?pwd=VFYibkh4emhETHNITGV0dXRHS3plZz09)  
[pwd=VFYibkh4emhETHNITGV0dXRHS3plZz09](https://uh-edu-cougarnet.zoom.us/j/95702511696?pwd=VFYibkh4emhETHNITGV0dXRHS3plZz09)

#### Abstract

On August 7th, 2020, HARC joined the Houston Harris Heat Action Team (H3AT) along with the City of Houston, Harris County Public Health, and the Nature Conservancy of Texas, to help find Houston and Harris County's warmest places through a one-day community science mapping campaign managed by CAPA Strategies and NOAA. The H3AT campaign was larger than any other campaign conducted by NOAA/CAPA by over 120 square miles, made possible by the efforts of 84 community scientists from Houston and Harris County. Teams of volunteer community scientists simultaneously drove one-hour routes at 6 AM, 3PM, and 7PM across 32 Houston and Harris County neighborhoods with temperature and humidity sensors attached to their cars. The campaign resulted in a series of maps depicting temperature and heat index throughout the day. The heat was disproportionately distributed across the Houston area with some areas, such as southwest of the Galleria, measuring ground temperatures as high as 103 degrees. Temperatures tended to be higher in more densely populated areas as well as more industrial areas. Several areas across the Houston area did not cool below 80 degrees. Using data collected from the 2020 H3AT campaign and similar mapping campaigns from other coastal cities, the Desert Research Institute (DRI) and HARC are conducting a two-year extreme heat risk modeling project funded by NOAA CPO. This study investigates how sea breeze influences heat forecasts for these communities along the coast, how high future temperatures will rise, and what areas will be most impacted by these changes.

#### Bio

##### Meredith Jennings

Since joining HARC in 2018, Dr. Meredith Jennings has provided project management, technical analysis, and stakeholder engagement to support projects such as the City of Houston Climate Action Plan (released April 2020), the 2020 Houston Harris Heat Mapping Project (H3AT.org), and ongoing research to increase affordable, renewable energy resources in low-income communities. Dr. Meredith Jennings received her Doctorate in Marine and Atmospheric Chemistry from the University of Miami from the Rosenstiel School of Marine and Atmospheric Science in 2017. She received her Bachelor of Arts in Chemistry from Hendrix College in Arkansas in 2012. As a 2017-2018 National Academy of Sciences' Gulf Research Program Science Policy Fellow, she led climate and health resilience building initiatives at Harris County Public Health. Professional interests include building cross-disciplinary partnerships and programs that promote community resilience and lessen the impacts of climate change.

##### Ebrahim Eslami

At HARC, Dr. Eslami focuses on research on air quality and sustainability. Currently, his main research interests are applications of machine learning in sustainability, health and cost impacts of air pollution, air quality modeling, and advanced environmental data analysis. At HARC, he has been involved in several research projects including the impact of COVID-19 on regional air quality, Harris County air quality planning, Precinct 2 air quality assessment, air quality and health impact of the Houston ship channel widening and deepening, and the H3AT urban heat island mapping project. Dr. Eslami brings over 10 years of research and application experience in the field of civil and environmental engineering, sustainable development, and advanced data analysis. He received his Bachelor of Science in Civil Engineering from the Sharif University of Technology in Iran in 2008. He continued his research as a research flow at SINTEF in Norway in 2009 and 2010 working on developing sustainable concrete materials from industrial by-products. Then he worked as an Engineer-in-Training in several construction projects in Iran between 2011 and 2014. He received his Master of Science in Environmental Engineering with an air quality engineering minor from the University of Tehran in 2016. His research improved the accuracy of the air quality models, especially for particulate matters, in Tehran, the capital of Iran. Dr. Eslami holds a Doctorate in Earth and Atmospheric Sciences from the University of Houston which he received in 2019. During his PhD, Dr. Eslami applied complex algorithms to address problems in atmospheric science such as real-time air quality, weather forecasting, hurricane tracking, and air pollution-induced health impacts.