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Introduction to GPS geodesy infrastructure in the Houston metropolitan area for urban geological hazards study

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High-accuracy GPS technology has been frequently applied to study geological hazards, such as earthquakes, volcanoes, faulting, and subsidence, during the past two decades. Currently, there are over 200 permanent GPS stations in the Houston metropolitan area. Data from these stations are available to the public through the Harris-Galveston Subsidence District and public data archive facilities at UNAVCO and the National Geographic Survey (NGS). A sophisticated local GPS geodetic infrastructure should comprise three components: A dense GPS network (hardware), a stable local reference frame (firmware), and software packages for real-time and post-processing positioning (software). The U.S. GPS employs the World Geodetic System (WGS-84) developed by the U.S. Department of Defense as its reference frame (datum) for defining the orbits and positioning its satellites. As a result, GPS positions are initially referred to a global reference. GPS positions within a global reference frame (e.g., IGS08) are not sufficient by themselves to precisely measure local-scale ground deformation. Slow local ground deformation could be overlooked or biased within a large-scale reference frame. This presentation will introduce the Houston GPS geodesy infrastructure with the newly established Stable Houston Reference Frame (SHRF). Current faulting and subsidence activities derived from GPS observations within the Houston metropolitan area will also be discussed.

Biography

Guoquan Wang is an Associate Professor at the University of Houston. He got his PhD degree in Solid Earth Geophysics from the Institute of Geology, China Earthquake Administration in 2001. He is the Director of the Houston GPS Network. His current research interests lies on high-accuracy GPS and its applications in natural hazards study.

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