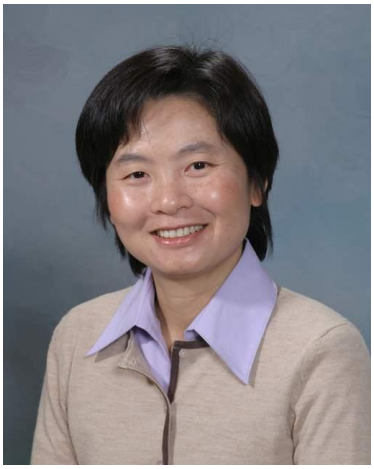
Asian American Engineer of the Year

Dr. Ruth C. Cheng



Research Computer Scientist
Engineer Research and Development Center
U.S. Army Corps of Engineers

Citation of Accomplishment:

Transformational impact on the application of computational engineering practice to scientific applications of significant national interest.

Dr. Ruth C. Cheng is an internationally recognized scientist known for her work in coupled models of subsurface, watershed, and coastal flow and transport. Dr. Cheng holds dual doctorates in Civil Engineering (1995) and Computer Science and Engineering (2002) both from Pennsylvania State University. Her reputation and practice is therefore based on expertise in both the physics and computational aspects of water resources research.

Dr. Cheng was recruited to the Engineer Research and Development Center (ERDC) in 2002 for the specific purpose of leading and developing the capability for conducting large-scale simulations of coupled flow phenomena. She has largely realized this purpose in a short time, by executing a number of high-profile projects and training a set of scientists and developers.

Dr. Cheng's many projects and assignments result from her pursuit of research and development opportunities and from customer recognition of her expertise. She is frequently sought after as a technical leader for investigations of coupled phenomena and has complete freedom in determining the appropriate technical course of action, as appropriate for a senior principal investigator with a significant research portfolio. Her recommendations and decisions are regarded as authoritative alike by customers, collaborators, and ERDC management.

One of Dr. Cheng's most significant contributions has been the coupling of two previously separated codes to produce accurate modeling of inland flooding due to storm surge. When she first came to ERDC, no one predicted the far-reaching impact of Hurricane Katrina, but there was an understanding that she represented the ability to model a new class of problems involving coupled flow processes. Her ability to couple surface and subsurface flows led quickly and naturally to the coupling of coastal and overland (watershed) flows, which is a new and unique crucially important capability. Her approach is to leave the physics of different codes in place, to understand the physics of the interface, and to develop the software coupling between them. As a testament to the wisdom of her approach, she is well-positioned to lead ERDC into the future study of climate change effects on coastal watersheds.