



Rafael Muñoz-Carpena, PE

Rafael Muñoz-Carpena, PE, ASABE Fellow, is the recipient of the 2022 John Deere Gold Medal for outstanding contributions to water quality by developing novel engineering design and modeling tools to mitigate surface runoff pollution with vegetation buffers.

Muñoz-Carpena is a professor of hydrology and water quality in the Department of Agricultural and Biological Engineering at the University of Florida. In this role, he teaches courses in integrated environmental systems analysis and modeling, including interactions between hydrological, ecological and human components, and identifying important drivers and uncertainty of these integrated systems. He also teaches research in hydrologic processes including hydrologic field and modeling studies of contaminant fate, and pollution control practices that improve the compatibility of agriculture and other human land uses with the surrounding natural ecosystem.

Muñoz-Carpena has made foundational contributions in water quality and hydrology, particularly in the development of widely adopted models. One such model, the Vegetative Filter Strip Modeling System (VFSMOD), incorporates knowledge from agriculture, engineering, chemistry, biology, and computational sciences to solve the major contemporary challenge not addressable from a single disciplinary perspective of mitigating surface runoff pesticide pollution from agricultural and urban lands by using properly designed dense vegetation buffers around surface water bodies. He also devel-

oped FITEVAL, a new model evaluation framework and software tool for objectively evaluating the acceptability of models considering uncertainties based on robust hypothesis testing.

Muñoz-Carpena also developed eSU, an improved method for global sensitivity analysis of engineering models based on the elementary effects method. This novel technology allows evaluation of large models, previously impossible, at a low computational cost, while still delivering robust results.

A 29-year member of ASABE, Muñoz-Carpena has served as a member and leader on a number of committees. He is currently a member of the Natural Resources and Environmental Systems Hydrology Group, Riparian Zones, Floodplains, and Wetlands committee, and the Streams Reservoirs, and Wetlands Group.

Muñoz-Carpena is author or coauthor of more than 375 peer-reviewed articles, book chapters, conference proceeding papers, and other publications. He also coauthored one book and edited five books. Throughout his career, Muñoz-Carpena has received a number of awards. Most recently, he received the Outstanding Alumni award from the department of biological and agricultural engineering at North Carolina State University. He was also inducted as a fellow of the American Association for the Advancement of Science. In 2015, he was inducted as an ASABE Fellow.

