

AQUIFER STORAGE RECOVERY: EFFICIENT AND COST-EFFECTIVE APPLICATIONS TO ACHIEVE FLORIDA'S WATER MANAGEMENT GOALS

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Droughts and floods dominate Florida's water management. Storage of water deep underground in ASR wells during wet months and years for recovery during dry months and emergencies is cost-effective and proven, augmenting water supplies and raising groundwater levels. About 30 different applications of ASR have been implemented to date. However, effective integration of ASR storage and surface reservoir storage is a goal yet to be achieved. This presentation will address several proposed ASR applications in Florida that would significantly augment storage in Lake Okeechobee; reduce flood discharges to estuaries; push back saltwater intrusion in the Lower East Coast Upper Floridan aquifer, creating a subsurface regional freshwater reservoir; and augment dry season flows to Everglades National Park. Impediments to achieving these goals will be addressed, including a regulatory framework that needs updating to encourage rather than discourage seasonal subsurface water storage rather than relying only on average annual allocations. One of the keys to achieving ASR success at each ASR well or wellfield is to conduct cycle testing so that an initial buffer zone is formed and maintained, separating the stored water that is required for recovery from the surrounding brackish, saline or relatively poor quality groundwater in the aquifer. The buffer zone is like the walls of a tank. Experience has shown that this low cost, simple approach achieves high recovery efficiencies while reducing arsenic to acceptable concentrations. Another key is to stack water vertically in adjacent ASR wells, storing recharge water in different, confined or semi-confined aquifers. Large water storage volumes can then be achieved in a very small area. When a stacked ASR wellfield is located and operated in conjunction with a large surface storage reservoir, such as Lake Okeechobee, optimized operation enables lower reservoir elevations while achieving improved water management, water supply and environmental goals.

PRESENTER BIO: Mr Pyne coined the term "aquifer storage recovery" and pioneered development of ASR science and technology in Florida, nationwide and globally. He has over 40 years of experience, including as a member of the NRC Peer Review Panel for the CERP ASR Regional Study scientific investigations from 2000 to 2015. [He is a UF graduate (MSE 1967 and PhD studies through 1969 (incomplete). BSCE Duke University, 1966]