

TURNING DOWN THE PUMPS: VARIABLE HYDROLOGIC RESPONSE TO PASSIVE RESTORATION AMONG WETLAND TYPES

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Water supplies throughout Florida are highly dependent on withdrawals from groundwater aquifers. In Tampa Bay and surrounding counties, historically high levels of aquifer pumping have been associated with the desiccation of geographically isolated wetlands. Prior to 2000, pumping volumes had increased substantially to meet development and urbanization. Pumping management after 2000 greatly reduced groundwater abstraction rates, potentially acting as a “passive” hydrologic restoration. To test whether pumping management was sufficient to restore altered wetland hydrology, pre- and post-2000 water level data were compared for riverine, forested, and marsh wetlands in the Morris Bridge wellfield; Morris Bridge had historically been pumped at up to nearly 20 MGD annual average production, but this rate was reduced to 11 MGD or lower after 2000. Hydrologic response to pumping management was highly varied both within and between wetland types. Comparisons of median water depth pre- and post 2000 revealed both increased and decreased water levels for riverine, forested, and marsh wetlands. In general, median water depths and duration of inundation in forested wetlands appeared to improve more than in riverine and marsh wetlands after pumping management was implemented. While average wet season water depth increased for a majority of all wetlands (across wetland types), only about 30% of wetlands saw an increase in dry season water depth. Critically, reference (unimpacted) wetlands in the same region showed consistent hydrologic regimes when comparing the pre- and post-2000 periods. These results suggest that wetland hydrologic regimes may not respond uniformly to withdrawal reductions, either within or across wetland types, despite management efforts at the entire-wellfield scale. Ongoing work seeks to determine the major drivers of vulnerability, resiliency, and recovery for specific wetland types in response to withdrawals and passive restoration.

PRESENTER BIO: Renee Price is a senior scientist with Atkins North America and doctoral student the University of Florida focused on wetland hydrologic and vegetation responses to potable water withdrawals and passive restoration.