DEVELOPMENT OF AN AQUIFER VULNERABILITY ASSESSMENT METHODOLOGY FOR SOURCE WATER PROTECTION

Cathleen Beaudoin Jonas[1], *James Dozier*[1], *Robert McConnell*[2], *and Shawn Jones*[2]
[1]HSW Engineering, Inc., Tampa, FL, USA
[2]Tampa Bay Water, Clearwater, FL USA

Tampa Bay Water's Source Water Assessment and Protection Program (SWAPP) for regional public drinking water supplies in southwest Florida includes water quality monitoring, source vulnerability assessments with identification of potential contaminant sources (PCS), and integration into a standardized geographic information system (GIS) platform. The regional system includes groundwater wellfields and dispersed wells in source water protection areas. Within these areas, there are a wide range of land use activities that may contribute to potential groundwater contamination. A previous PCS ranking methodology was based on the proximity of PCSs to wellheads and travel time through the upper Floridan aquifer (UFA) only, presence of bulk storage, and environmental database records. Potential groundwater contaminant migration from the surficial aquifer into the UFA is mitigated by the presence of the Intermediate Confining Unit (ICU) where present and is proportional to the vertical hydraulic conductivity and thickness of the ICU. For this project, an Aquifer Vulnerability Analysis (AVA) methodology was developed that incorporates potential effects of hydrogeology and anthropogenic stresses upon travel time through the ICU to the top of the UFA to improve the PCS ranking methodology.

The Integrated Northern Tampa Bay (INTB) model provides an advanced, physically-based, hydrologic simulation tool which supports ongoing regional water management activities. The INTB model incorporates local-scale geologic and historical atmospheric, hydrologic, and pumping data collected at the wellfields and regionally. Groundwater levels and aquifer parameters from the INTB model were used to determine the velocity and associated travel times from the surficial aquifer through the ICU to the UFA and integrated to develop localized aquifer vulnerability zones. The AVA information was then incorporated into Tampa Bay Water's SWAPP GIS platform and used to improve the groundwater PCS ranking methodology and prioritization for source protection.

PRESENTER BIO: Cathleen Beaudoin Jonas is a Principal Hydrogeologist at HSW with over 25 years of experience in water resources investigations. James Dozier is a Senior Hydrogeologist with HSW. Robert McConnell is Source Water Assessment Manager for Tampa Bay Water. Shawn Jones is a Water Quality Scientist with Tampa Bay Water.