Fifteen Years and Going Strong – More Suffolk County Groundwater Model Applications

Mary Anne Taylor, P.E., Daniel O'Rourke, P.G., and John Boyer, P.E., BCEE, D.WRE

In 1996, Suffolk County Department of Health Services (SCDHS) commissioned the development of three dimensional computer models of the County's groundwater system. SCDHS made the project objectives clear – they did not want another report for their bookshelf, but a tool that they could use to help to understand and manage the County's water resources. Within six months, a regional groundwater flow model was developed and calibrated; salt water intrusion models were subsequently developed to represent the North and South Forks and Shelter Island. Through the years, a variety of model applications helped the County to assess the impacts of drought, sanitary sewering programs and sea level rise on groundwater resources; evaluate potential impacts of contaminant releases and investigate potential sources of observed groundwater contamination; site monitoring wells; and design remedial systems.

In 2011, the models continue to reside on SCDHS and SCWA machines, and they continue to provide the framework for new studies of groundwater quality and quantity and help to guide planning activities. The purpose of this presentation is to share several of the most recent Suffolk County groundwater model applications that were developed to support the County's comprehensive water resources management plan.

One of the important applications was a follow-up to the source water assessment program conducted for the New York State Department of Health in 2003; the groundwater models were used to delineate the contributing areas to over 700 existing and proposed community supply wells. As part of the County's planning efforts, groundwater contributions to surface waters were also considered; the land surface areas contributing groundwater baseflow to fresh and marine surface waters were also delineated. The identification of areas where above-ground activities have the potential to impact ground or surface water quality provided the basis for development of water quality protection strategies.

A second application helped to assess groundwater nitrate levels resulting from unsewered residential developments of various densities. This series of simulations representing the impacts of hypothetical new developments, along with the contributing area assessments, provided valuable information to help guide water quality protection recommendations.