

Report as of FY2006 for 2006DE70B: "Hydraulic Properties of the Unconfined Aquifer in Southern New Castle County"

Publications

- Water Resources Research Institute Reports:
 - Wolff, E., and A.S. Andres, 2007, Hydraulic Properties of the Unconfined Aquifer in Southern New Castle County, Delaware Water Resources Center, University of Delaware, Newark, Delaware, 17 pages.
- Other Publications:
 - Boyd, A., ed., 2006, Delaware Water Resources Center WATER NEWS Vol. 6 Issue 2 Nine DWRC Internship Winners for 2006 2007, <http://ag.udel.edu/dwrc/newsletters/Summer06.pdf>, p. 6-7.

Report Follows

Undergraduate Internship Project #1 of 9 for FY06

Southern New Castle County is a water source for domestic, irrigation, and public well use, the source of all base flow in local streams, and a conduit to all ground water in deeper confined aquifers. Measuring the saturated hydraulic conductivity of this important aquifer was the goal of *Elizabeth Wolff's* project "*Hydraulic Properties of the Unconfined Aquifer in Southern New Castle County.*" Her research will allow future quantitative analysis of water availability, sustainable pumping rates, and contaminant transport. Elizabeth was advised by Mr. Scott Andres of the *Delaware Geological Survey (DGS)* for her *DWRC / DGS* co-sponsored internship.



“My experience this past summer was quite enriching. I learned a great deal about the process of data collection, interpretation, and analysis. This project was enjoyable, and I would recommend it to future undergraduate researchers.” - Elizabeth Wolff

Abstract

In many hydrologic studies, hydraulic testing is required to determine rates of recharge, groundwater flow, and contaminant transport. These rates are related to the hydraulic conductivity (K) and porosity (n) of earth materials. In this study, K is ascertained through lithological records and compared to single-well aquifer tests. Using procedures outlined by previous studies, over 50 single-well aquifer, or slug, tests were administered in monitoring wells located at three spray irrigation facilities in the southern portion of New Castle County. The methods described by Bouwer (1989) were used to analyze the data. Statistical procedures (f test) of results found no significant differences in variance between the sites indicating that all K came from the same population. The values found for K ranged from a minimum of 0.14 ft/s to a maximum of 580 ft/s with an overall average of 182 ft/s. Lithological descriptions were inadequate for interpreting the findings.