CE 890 Graduate Seminar

SPEAKER: Paul Bruss, M.S. graduate student
(Advisor: Dr. David Steward)

TOPIC: "Forecasting Water Use Trends and Groundwater Availability in the Ogallala Region of Kansas Using a Groundwater Model"

DATE: October 13, 2010

TIME: 4:00 p.m. (refreshments at 3:45 p.m.)

PLACE: 1052 Rathbone Hall

ABSTRACT

The state of Kansas relies on groundwater for as much as 85% of the total water used each year. The primary use made of groundwater in Kansas, nearly 94% of total groundwater used, is for irrigation. The Ogallala Aquifer is one of the primary sources of irrigation water for agriculture in western Kansas. Despite the Ogallala's vast resources as a whole, water availability in Kansas varies significantly both spatially and temporally and declining groundwater resources in some areas have put pressure on the various agricultural industries that rely on it. In an effort to sustain agriculture and the environment into the future, there is a need for ongoing research of how we use groundwater and how the resource availability has changed over time. Greater understanding of these two aspects will lead to better understanding of future water use and resource availability in the region.

In this study, historic and current trends in groundwater use and agricultural production were investigated and correlations were made. Using a groundwater model, saturated thickness of the Ogallala was predicted out to 2050. Also, by adapting the groundwater model, current and future water use trends for different areas of the aquifer were modeled by relating change in saturated thickness per year to volume of water pumped for irrigation. Results of the predicted saturated thickness indicated significant decline in groundwater resources over the next forty years. Water use trends developed from the adapted groundwater model matched historical water use data fairly well, and projected trends were in agreement with current outlooks for each area. As forecasting of the water use trends and resource availability improves, better information can be supplied to decision makers who can make necessary changes at the right time to achieve long-term sustainability for the agricultural industries that depend on groundwater.