CE 890 Graduate Seminar

DATE: September 24, 2008

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

PLACE: Rathbone 1052

SPEAKER: Trevor Ahring, M.S. candidate

TOPIC: **"**Phreatophytes in Southwest Kansas: An Ecohydrologic Study"

ABSTRACT

In the 1950's, the High Plains Aquifer in western Kansas started to be pumped for irrigation purposes. Since this time, there has been a rapid decline in both groundwater elevation and river streamflow in southwest Kansas. This project studies the relationships between riparian phreatophyte (mainly cottonwood and saltcedar) distribution along the Arkansas and Cimarron Rivers and soil type, depth to groundwater, change in depth to groundwater over time, and streamflow.

Aerial photography from the 1950's and 1960's in the High Plains Aquifer region along the Cimarron and Arkansas Rivers was scanned and then georeferenced using ArcMap software by ESRI. Photography from 2006 was obtained from the Kansas Geospatial Community Commons (KGCC) website. Well data was used to determine depth to groundwater. Soils data was collected from the Soil Survey Geographic (SSURGO) Database for each county. Six study areas featuring differences in soil type, streamflow, depth to groundwater, and tree distribution were selected in southwest Kansas. Definiens' eCognition software was used to measure tree canopy area in the aerial photography. Statistical analysis will be conducted on these results to determine relationships between tree distributions hydrology.

The results of this study can be used to determine the role of phreatophyte distributions on the hydrologic cycle. The relationship between soils, water declines and cottonwood survival are indicators for hydrologic connectivity between groundwater and surface water. The results can also be used to help understand future hydrology, such as identification of locations for future artificial recharge projects.