# TSM 352 Land and Water Mgt Systems

**Comprehensive Irrigation Lab**

**(Due Tuesday, May 5th, 2015)**

**Irrigation Water Requirements**

A farmer near Effingham, Illinois wishes to deepen an existing pond (pond.asc) to provide water to irrigate the area between the 621.5 and the 623.5 contours on a nearby field (pondfield.asc), on which he grows vegetables between May 1st and September 30th. Rainfall data may be obtained from the Illinois State Water Survey: <http://www.isws.illinois.edu/data/climatedb/>

The potential evapotranspiration (PET) over the period may be assumed to be 25.3 inches.

1. Determine the acreage to be irrigated.
2. Given the origin of the local coordinates for the field is 39.15882277, -88.72200856, determine the dominant soil types in the area to be irrigated.
3. Determining the unexcavated storage volume of the pond and the storage volume if it is excavated to a uniform depth of 3 feet.
4. Based on the distribution of water deficit (PET-Rainfall) over the period, what are the return periods corresponding to the storage volumes calculated above?
5. If the famer wishes the pond to provide sufficient water to meet the crop requirements in 4 out of 5 years, on average, how deep does the pond need to be?
6. If the pond were 4 feet deep, what is the probability that it would not have enough water to meet the crop requirements in a given year?