School of

Civil Engineering

&

Environmental and Ecological Engineering

Presents

Environmental Engineering Seminar

Tuesday, November 5

2:15 p.m refreshments

2:30 p.m seminar

HAMP 1113

PURDUE UNIVERSITY

Julia Wiener

Assessment of Water Use and Reuse in the Wabash Watershed

ABSTRACT

In the context of population growth, water scarcity, and climate change, the global increasing demand for freshwater makes it necessary to find innovative means to extend the life of our water resources and to manage them in a sustainable way. The management of water resources is a critical function to sustain potable water supply, food production, manufacturing, energy production, recreation, and to maintain the natural ecosystems. For that purpose, vast amounts of data are collected and archived continuously by federal and environmental regulatory agencies on all US, however without coordination, integration or organization of the many heterogeneous data sets. As a result, sophisticated high performance data analysis and resource management is not possible and the capability to holistically manage critical water resources at large watershed scales (e.g. the Wabash River basin) does not exist. Recently, the National Research Council concluded that an analysis of the current status of indirect (i.e., unplanned) water reuse is a critical need for understanding the role of water reuse in meeting fresh water demands. The implications in terms of water resources planning, human health, and freshwater ecosystems conservation are significant. An initial assessment was performed for the Wabash River Watershed for the year 2007. By documenting water withdrawals and treated wastewater discharges, we were able to identify how much, and for what purposes, the water resources of the basin are being used. We analyzed the characteristics of current databases, determine how to enhance access to currently available data to support watershed scale management, and recommend how to modify the acquisition and storage of water data to adapt to future information needs. Furthermore, we completed an indirect water reuse analysis by documenting both water discharges and stream flows at selected points within the watershed. Results of the water reuse estimations show that during the low flow months of July-October, 2007 discharges into the Wabash River from 1,100 facilities upstream of Mt. Carmel, IL contributed 70 to 100% of the Wabash River stream flow volume. For other months of the year, the proportion of Wabash River water that had passed through some type of facility ranged from 5 to 53%. The results of this case study indicate that at the watershed scale water use and reuse is significant.

BIO

Julia Wiener is a PhD student in the Ecological Sciences and Engineering Interdisciplinary Graduate Program, working with Dr. Nies and Dr. Jafvert. As Graduate Professional Assistant in the Women in Engineering Program, she coordinates outreach engineering programs for middle and high school students. She also serves as Graduate School's Global Ambassador. She received her B.S in Industrial Engineering from the Universidad Nacional de La Plata, Argentina.