

# CVEN 627 “Engineering Surface Water Hydrology”

## HOMEWORK 1

*Assigned 1/25/06*

*Due 2/1/06*

Assignment: Compute the sequence of monthly values of the Palmer Drought Severity Index (PDSI) for Peoria, Illinois, from January 1948 to December 2004.

Available from the class website is daily data for precipitation, maximum temperature, and minimum temperature as measured at “PEORIA GREATER PEORIA AP” (NOAA COOP ID 116711) for the period named above. Also available is an Excel file containing Visual Basic code (i.e., macros) to import the data into Excel spreadsheets. Dr. Brumbelow will demonstrate in class how to use these macros. Note that additional data will also be processed – it will be used in later assignments.

You will need to do the following:

1. Calculate average temperature each day as the simple mean of the daily maximum and minimum temperatures.
2. Process all daily data into monthly data. For temperature, determine the mean over the days of the month. For precipitation, determine the sum.
3. Determine the 12 monthly average temperatures for use in the Thornthwaite potential evaporation (PE) equation.
4. Mean daily hours of sunshine at Peoria:

Jan	9.34
Feb	10.35
Mar	11.67
Apr	13.17
May	14.33
Jun	14.91
Jul	14.65
Aug	13.65
Sep	12.24
Oct	10.63
Nov	9.41
Dec	9.07
5. Use the Thornthwaite equation to compute monthly PE.
6. Complete water balance calculations.
7. Complete monthly coefficient calculations.
8. Complete sequence of precipitation deficit and PDSI values.

Please turn in a hard copy write-up of your work with a time-series graph of PDSI values and a table that summarizes basic statistics of the sequence (min, max, mean, etc.). Submit by e-mail the electronic file containing your work.

You are free to use any methods you choose, but I would strongly encourage you to develop some VB code as part of your work.