

Identification of Stress Periods for ELM-Sulfate Output Analysis

Mark Shafer, April 25, 2013

ASR Stress Period Hydrologic Classification		
ASR Stress Period	Lake Discharges to Basin (based on D13R CERP Flows at S351 and S352)	Rainfall (1965-2005 RSMBN Model Input Data for Southern EAA)
1974 Dry Season (5/74) end of 30-d mean = 1974/05/31	Above Avg Lake Discharges (88th percentile)	Below Avg Dry Season (10th percentile)
1974 Wet Season (10/74) end of 30-d mean = 1974/10/28	Above Avg Lake Discharges (98th percentile)	Average Wet Season (68th percentile)
1981 Wet Season (10/81) end of 30-d mean = 1981/10/21	Below Avg Lake Discharges (20th percentile)	Drier than Avg Wet Season (33rd percentile)
1982 Dry Season (5/82) end of 30-d mean = 1982/05/19	Below Avg Lake Discharges (8th percentile)	Wetter than average dry season (77th percentile)
1989 Wet Season (10/89) end of 30-d mean = 1989/11/08	Average Lake Discharges (55th percentile)	Average Wet Season (62nd percentile)
1990 Dry Season (5/90) end of 30-d mean = 1990/06/06	Average Lake Discharges (58th percentile)	Average Dry Season (35th percentile)

Selection Process:

1. Significant ASR discharges had to occur prior to selected month.
2. Some change in sulfate was observable at one or more of the ELM Indicator Regions 45, 46, 47, 48 (ELM v2.8.5, locations in northern and western WCA-3A). A delta of 8-10 mg/L sulfate was generally used to identify impact periods.
3. The selected stress periods would be grouped in pairs to better illustrate long-term impacts.

An initial list of 8 or 10 stress periods were identified and then the percentile ranking for the wet season and dry season rainfall and lake discharge volume was computed for each stress event. Final selection of stress periods of interest was prepared using the criteria that wet, dry and average flow/rainfall conditions would provide representative hydrology.

To get an idea of the time history of impacts at a particular ELM Indicator Region, the (daily) time-series data from any Indicator Region can be graphed in Excel if needed.