

File Formats for American and Carson River
Streamflow and SWE Simulations
December 7, 2007

Note: we will use the DMIP 1 format for streamflow simulations

1. Here is the file format we need for the submitted simulations. Recall that we have requested hourly time series of simulated instantaneous discharge and swe in Z time. The FORTRAN (in one case C/C++) statements that will generate this format are provided below.

The data files consist of 2 sections: Header with comment lines and two lines of descriptive data, and the data values themselves.

a. Header Format

Header information is necessary for identifying and managing the files.

- Comment lines: text lines (each line not more than 80 characters) that include participants name and other information a participant wants to note, such as model name, time step, type of simulation, etc. Comment lines start with an '\$' sign in the first position;

```
- First Non-Comment Header line:  
write(*,20) dtype,dimens,units,dt,id  
30 format(14X,A5,A5,A5,A5,A15)
```

```
where : (for streamflow)  
dtype= 'SQIN ' ;  
dimens= 'L3/T ' ;  
units= 'CMS ' ;  
dt= '1 ' ;  
id= <HL specified basin id>
```

- or -

```
where : (for snow water equivalent)  
dtype= 'SWE ' ;  
dimens= 'L ' ;  
units= 'MM ' ;  
dt= '1 ' ;  
id= <HL specified basin id>
```

```
- Second Non-Comment Header line:  
write(*,30) strt_month,strt_year,end_month, end_year,ncol,format  
30 FORMAT(I2,2X,I4,X,I2,3X,I4,X,I2,3X,A5)
```

```
where:  
strt_month & strt_year are starting month and year of  
simulations, (MM YYYY)  
end_month & end_year are ending month and year of simulations,  
(MM YYYY)  
ncol=' 1';  
format='F9.3'
```

Recall in the DMIP-2 Sierra Nevada Modeling Instructions that the calibration period is October 1, 1988 - September 30, 1997 for the NF American and October 1, 1990 - September 30, 1997 for the EF Carson. For both basins, the validation period is October 1, 1997 - December 31, 2002.

Participants can start their model runs whenever they want, but must submit simulated time series starting on October 1, 1988 for the NF American and October 1, 1990 for the EF Carson. For convenience, participants should submit simulations (calibrated and uncalibrated) that span both the calibration and validation periods: October 1, 1988 - December 31, 2002 (NF American) and October 1, 1990 - December 31, 2002 (EF Carson). HL has software that can separate the calibration period and validation period to compute statistics. HL's software can also compute statistics on individual events as well as the entire run period.

b. Data Format

Two format statements are provided for actually writing the discharge data values to the file: one in FORTRAN, the other in C/C++.

a) FORTRAN

```
WRITE(*,10) five_letter_basin_id, day, month, year, hour,
discharge
10 FORMAT(A5,5x, 3I2, I4, F9.3)
```

b) C or C++

```
fprintf("%s      %02d%02d%02d%4d%9.3f\n", five_letter_basin_id,
day,month,year,hour,discharge);
```

2. NOTES:

- a. Discharge values must be in CMS (cubic meters per second)
- b. SWE values must be in mm (millimeters)
- b. The format specification of the data must begin in column 21.
- c. Complete months of data must be present. For example, the first value in the time series must be for the first hour of the first day of the month (e.g., October 1, 1988, at 1Z). The last value in the time series must be for the last hour of the last day of the last month, (e.g., December 31, 2002 at 24Z). In order to satisfy this requirement, submitted time series should start on October 1, 1988 (1990 for the EF Carson) and end on December 31, 2002.

3. Example of the data in this format is as follows: NOTE: 'HLRMS' in the first non-comment line below is not necessary. Blanks are acceptable for the first 14 spaces in this line as specified in the Header Format specifications for this line.

Streamflow example:

```
$ Comment Line
$ Comment Line
$ Comment Line
HLRMS          SQIN L3/T CMS 1      WTT02
10 1988 12    2002 1    F9.3
WTT02      011088  1    1.998
WTT02      011088  2    2.977
WTT02      011088  3    4.211
WTT02      011088  4    5.480
WTT02      011088  5    6.691
WTT02      011088  6    7.863
WTT02      011088  7    9.044
WTT02      011088  8   10.259
WTT02      011088  9   11.490
WTT02      011088 10   12.691
WTT02      011088 11   13.815
WTT02      011088 12   14.824
WTT02      011088 13   15.709
WTT02      011088 14   16.485
WTT02      011088 15   17.191
WTT02      011088 16   17.883
WTT02      011088 17   18.628
WTT02      011088 18   19.497
WTT02      011088 19   20.554
WTT02      011088 20   21.848
WTT02      011088 21   23.400
WTT02      011088 22   25.196
WTT02      011088 23   27.184
WTT02      011088 24   29.282
WTT02      021088  1   31.389
WTT02      021088  2   33.403
WTT02      021088  3   35.235
```

SWE example:

```
$comment line
DATACARD      SWE L      MM      1
10 1988 12    2006 1    f9.3
           1088  1    0.000
           1088  2    0.000
           1088  3    0.000
```