C1 hourly data download, import, and merge workflow:

1. Download hourly C1 data from Niwot LTER FTP
   1. <ftp://niwotftp.colorado.edu/pub/climdat/>
2. Create format date range and header file for the \*.c1 files
   1. \*.c1 files are the earliest in the record and follow a different format than later files
   2. Their formats are based on the date on which data was collected
   3. The collection date is indicated in the file name (ddmonyy.c1)
      1. Ex: 09oct95.c1
         1. Meaning the file was collected on 09-10-1995
   4. Format date range file = c1\_hrly\_formatlist.csv
   5. Header file for \*.c1 files = nwt\_c1\_hrly\_headers\_oldformat.csv
3. Examine the \*.c1 files as some are not csv files, but rather space-separated tables with the column number indicated in each variable entry and the entries for one date spread over multiple rows
   1. The entries for each date must be put onto single rows
      1. Accomplished through find and replace on TextMate
   2. Space-separated tables changed to csv files:
      1. 31oct91.c1
      2. 1jul91.c1
      3. 2may91.c1
      4. 11sep92.c1
      5. 28feb91.c1
      6. 30sep91.c1
      7. 31aug91.c1
      8. 31jan91.c1
      9. 31jul91.c1
      10. 31mar91.c1
      11. 31may91.c1
   3. These will have to be imported into R differently than the others
   4. Not all \*.c1 files start with a 2-digit day
      1. These have been corrected in the file names so all have 2-digit days and 7-digit dates
4. The \*.c1 files have issues with missing data, irregular time series, and bad data
   1. See c1\_hrly\_startdate\_enddate\_issues\_highlighted.xlsx for details
5. The earliest data files record at a 2 h timestep. Data are missing for 18 days from 1987-12-27 to 1988-01-15.
   1. 2 h files:
      1. 30sep87.c1
      2. 27dec87.c1
      3. 31mar88.c1
      4. 30jun88.c1 (switches to 30 min data at JD165)
   2. It might be best to omit early datasets from processing and analysis
      1. Confirm with Noah
6. Import date ranges for files so dates can be added
   1. 01apr93.c1 and 04jan95.c1 start dates changes
   2. Really begin on 3/4/93 at 100 and 11/14/94 at 100, respectively
      1. Not the day prior at 0 like the old file says
7. Import workspace of newer files
8. Merge the old, formatted ASCII data with new data
9. Export
10. In early part of completed, exported hourly file, wind\_spd\_vector and sw\_in\_tot\_mj seem to be switched
    1. There is also a break in the sw\_in\_tot\_mj data on 1991-01-29
       1. Here it looks like sensors were changed
       2. Data go from low values to higher values
          1. The low values might all be in langleys
       3. Check metadata closely
    2. **The data have been switched to their proper locations (2015-12-30)**