Notes with Jeff Davidson

June 27, 2024

* Johannes from Germany with 130+ lysimeters uses [DIAdem software](https://www.ni.com/en/shop/data-acquisition-and-control/application-software-for-data-acquisition-and-control-category/what-is-diadem.html) to process NSEs.
  + Jeff to forward these communications to AJ
* AJ to discuss with Allan and Jose about lysimeter weather station and alternatives
  + Should we consider taking off the weather station from the monolith since we don’t use it for ETr anymore due to the lateral move sprinkler?
  + Use new [licor LI-710 device](https://www.licor.com/env/products/LI-710/) for NSEs instead?
* Jeff to send AJ 2022 NSE event list
* Jeff to send AJ METS data:
  + 2022
  + 2023
  + Also send AJ the METS datalogger program (CRB file) so that I can look at the ET calculation built in the code (if possible! Not necessary right away).
* Jeff to send AJ the water balance spreadsheet for 2022
* Jeff to send AJ 2023 Lysimeter data thus far
  + AJ to run it through the code and send jeff the interactive graphic
* AJ future work
  + Integrate METS data into Lysimeter data
  + Calculate ETr based on METS crbasic code
  + Begin water balance calculations

# Lysimeter Data Processing

* There are seven pieces of information we need for each non-standard event (NSE):
  + Date.
  + Time event started.
  + Time event stopped.
  + Load cell reading when event started.
  + Load cell reading when event stopped.
  + Estimated ET rate when the event started.
  + Estimated ET rate when the event stopped.
* Example of an NSE from 2022 data:
  + Data start at 3/4/22 15:45
  + Suspected start time (STT) 3/5/22 9:45
    - Record load cell reading at STT
      * 1.652285
    - Find 1hr prior load cell reading (1HR)
      * 3/5/22 8:45
      * 1.652367
  + Find rate of change between STT and 1HR
    - | STT – 1HR | = rate of change (ROC)
    - | 1.652367 – 1.652285 | = 0.000082
      * Normally, Jeff/Lane rounds to 4 decimal places. Jeff will inquire why
      * AJ might carry out all digits contingent upon Jeff’s findings
  + To be continued…
    - Jeff and AJ’s meeting ran of out time here.

# Notes

* On excel sheet tab “Lysimeter Load Cells”
  + Red line is most important; blue line is redundant backup for QC
* Official water balance start date for each year (i.e., what will be recorded and archived for the state) is day of planting for the crop on the lysimeter
  + 2024 – Corn, May 3
  + 2023 – Onion, Jeff will get back to me
  + 2022 – Onion (failed), forage sorghum started instead; Jeff will get back to me
* Generally, we find the areas where the slope changes significantly to identify where weight was added (e.g., irrigation, AJ steps on it) or subtracted (i.e., ET).

# Action Items Until Next Meeting

* AJ to start generating code that:
  + Imports data
  + Calculates columns
  + Calculates rate of change for each 48 hour period
  + All for 2022 data