

QA/QC Meeting 16 Nov 2023

Participants: LH, IF, YW, FT, LA, LS, AS, XZ, KMK (9)

Talking Points

- New dates for 2024: <https://www.swissfluxnet.ethz.ch/index.php/data/meetings/qa-oc-meetings-monthly/>
- Some EC raw data ASCII files were not completely correct and were deleted from the server. Affected sites are FRU (since 2017), OE2 (since 2021) and CHA (since 2021). The newest version of bico (v1.6.0) can convert these time periods correctly. Past flux calculations are NOT AFFECTED by this issue.
- The VVA GROUP RDS was reset and is currently updated. The calcs of autofluxes and autoconversions are interrupted but will be back soon.
- Reminder: FluxCoffee notes with lots of details about flux calculations and more are available in Teams (Data/FluxCoffee)
- Reminder: Make sure to check the plots of a random EC raw data file from time to time
- Checking recent webcam images
- Checking SW_IN, VPD and TA, site overview
- Checking recent fluxes
- The wind component w shows an offset during some time periods at some sites, maybe we can correct this directly in EddyPro (see next slide). This seems to be a recurring issue for CH-CHA.

ALL SITES Recent webcam pictures



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General Info

- **Attendance:** If you are (Tech-)SRP, please attend QA/QC meetings or tell LH if you can't, needed for planning of the meetings.
- **Short statement:** SRP & Tech-SRP: please prepare short statement about your site and post it on the slide together with the plot(s). You can also extend the already available text snippet(s) from previous meetings. (max. 2 sentences)
- **Purpose:** The purpose of QA/QC meetings is to check on current, incoming data. SRPs choose specific issues we should look at together and discuss in the group. Fluxes are checked if the respective SRP wishes to do so.
- **Variables:** There is a list of known variable abbreviations that you can use in case you wonder what an abbreviation means: [Variable Abbreviations](#)
- **Check of EC raw data files:**
 - Recommended check for SRPs and T-SRPS: take a look at EC raw data files and check if they look OK
 - Current EC raw data files are automatically converted to ASCII each day (done by the Python script bico)
 - Files and their plots can be found here, e.g. for CH-LAS:
`gl-processing\CH-LAS_Lae-Subcanopy\20_ec_fluxes\2022\raw_data_ascii`
- **Weekly flux calculations on the RDS:**
 - Please calculate fluxes and check them once per week, or more often if you wish to do so.
 - If you cannot calculate the fluxes, try to find a substitute, e.g. LH.
 - Please move your Level-0 results from the RDS to the respective Level-0 folder.
- **RDS folder:** The folder P:\Flux\RDS_calculations is a temporary folder. Please move Level-0 flux calculations (preliminary fluxes) to the Level-0 folder on gl-processing. For example, for CH-CHA move files to Z:\CH-CHA_Chamau\20_ec_fluxes\2022\Level-0 (gl-processing is mounted as drive Z in this example).
- The RDS now has access to the database. This means that we now have a shared working environment where we can run Jupyter notebooks.
- **FluxCoffee:** separate meetings to discuss data related issues, e.g. flux processing and technical issues, started and will continue to take place. There are extensive notes available in the Data/FluxCoffee group on Microsoft Teams.
- **List of QA/QC Meeting dates:** [QA/QC Meetings 2024](#)



Processing Options

Statistical Analysis

Spectral Analysis and Corrections

Output Files

Raw Processing Options

Raw data processing

Wind speed measurement offsets U: 0.000 [m/s] V: 0.000 [m/s] W: 0.000 [m/s]

- Fix 'w boost' bug (Gill WindMaster and WindMaster Pro only)
- Angle-of-attack correction for wind components (Gill's only)
- Axis rotations for tilt correction

Method: Select automatically
Rotation method: Double rotation

Turbulent fluctuations

Detrend method: Block average

Time constant: 250.0 [s]

- Time lags compensation

Time lag detection method: Covariance maximization with default

Compensation of density fluctuations

- Compensate density fluctuations (WPL terms)
- Add instrument sensible heat components, only for LI-7500

Surface temperature estimation: Simple linear regressions

Multiple regressions

Day time Nighttime

Bottom: $T_{wb} = 0.944 \cdot T_s + 2.57$ Top: $T_{wb} = 1.005 \cdot T_s + 0.24$ Spar: $T_{wb} = 1.010 \cdot T_s + 0.35$

Restore Default Values Default values as from Burba et al. (2008)

Other options

- Quality check
- Footprint estimation

Flagging policy: Mauder and Foken (2004) (0-1-2 system)

Footprint method: [G]un et al. (2004)

Maybe we can correct the the w offset issue during the affected time periods with this setting here?

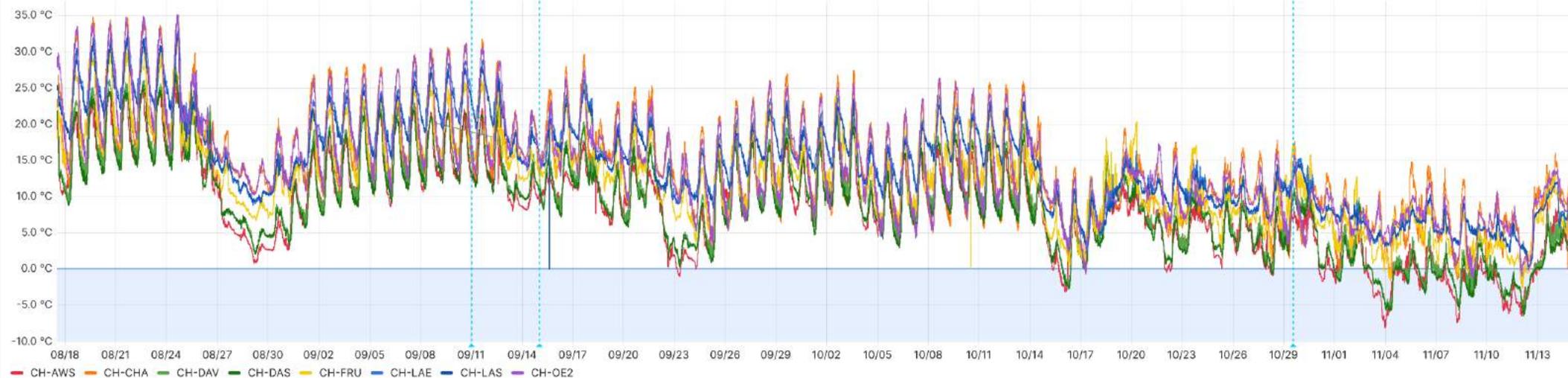
Restore Default Values



Air Temperature

- raw data
- no quality checks
- full resolution

Air Temperature ♥



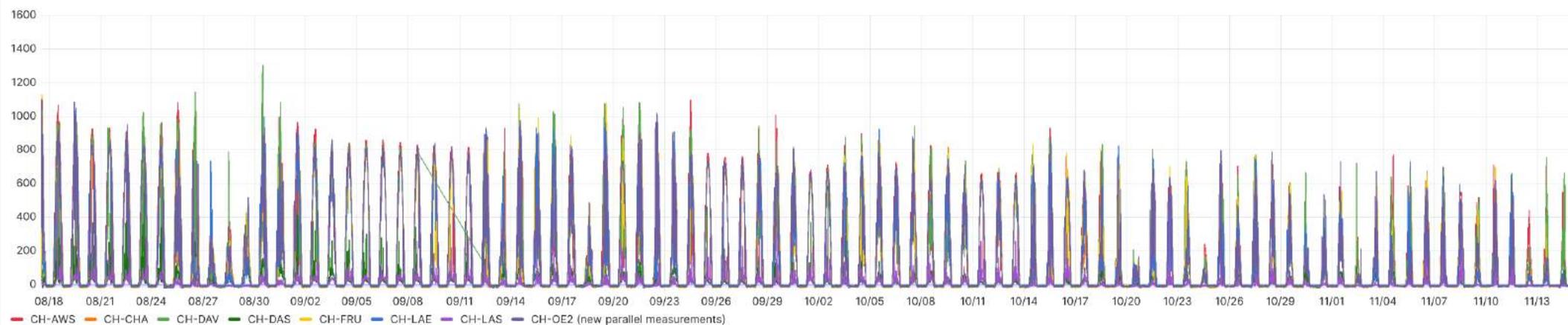
Max

CH-AWS	26.8
CH-CHA	35.2
CH-DAV	28.1
CH-DAS	26.9
CH-FRU	32.6
CH-LAE	33.3
CH-LAS	32.4
CH-OE2	35.2

Shortwave Incoming Radiation

- raw data
- no quality checks
- full resolution

Shortwave Incoming Radiation

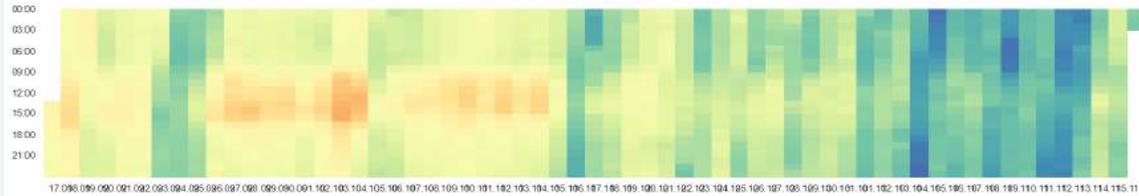


Max

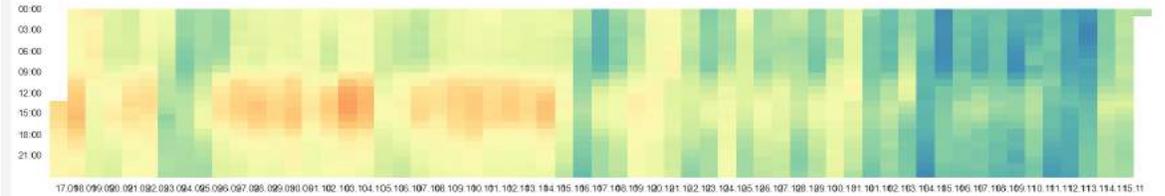
CH-AWS	1103
CH-CHA	1048
CH-DAV	1306
CH-DAS	587
CH-FRU	1129
CH-LAE	1051
CH-LAS	
CH-OE2	1098

Air Temperature: Last 60 days ...

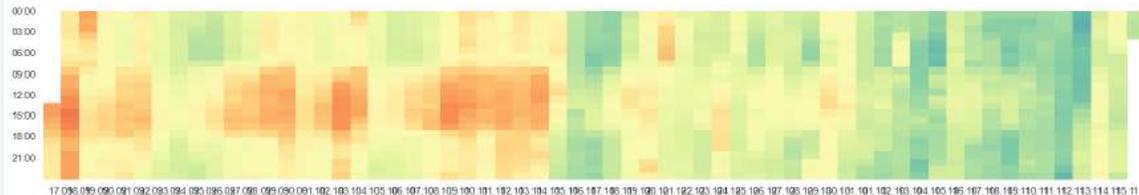
CH-AWS (hourly)



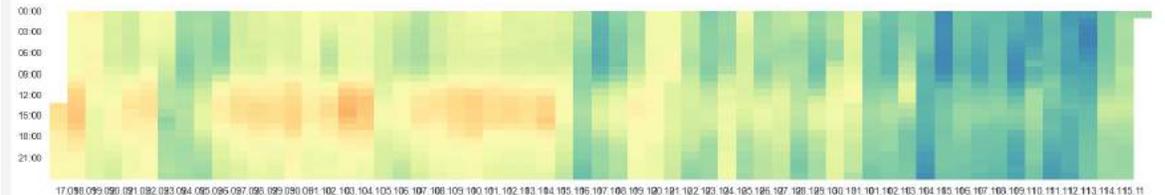
CH-DAV (hourly)



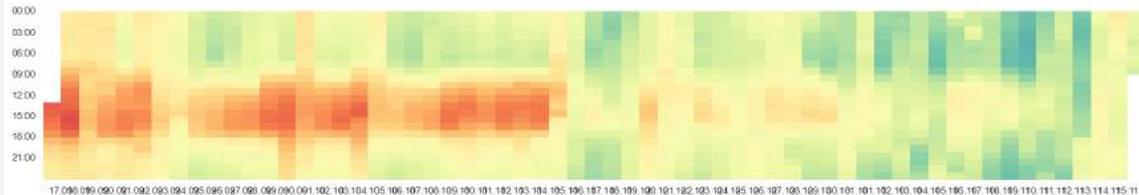
CH-FRU (hourly)



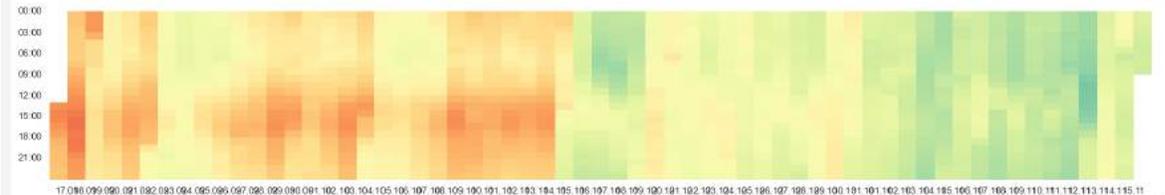
CH-DAS (hourly)



CH-CHA (hourly)



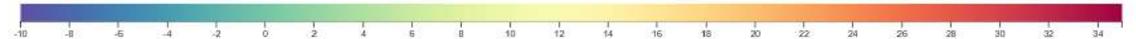
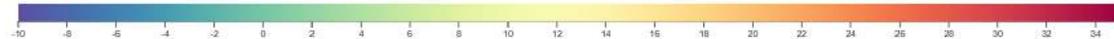
CH-LAE (hourly)



CH-OE2 (hourly)



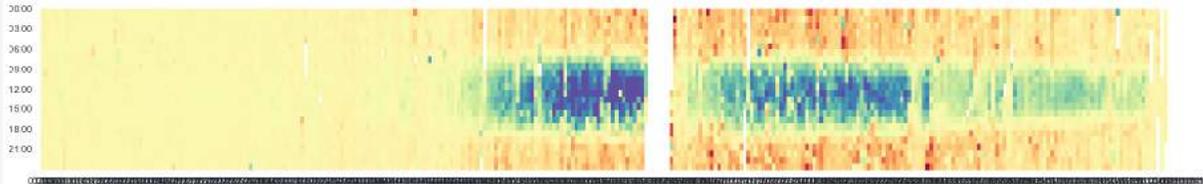
CH-LAS (hourly)



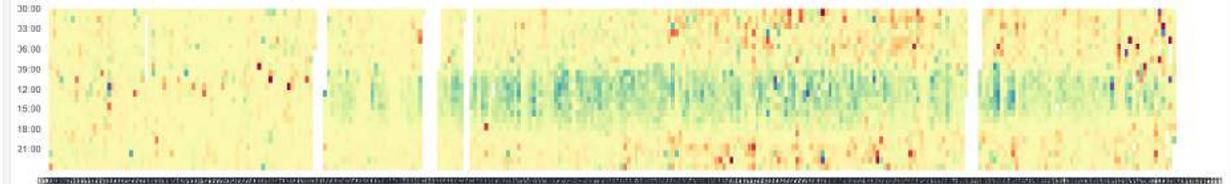
CO2 flux: This year so far ...

✓ Dashboard saved

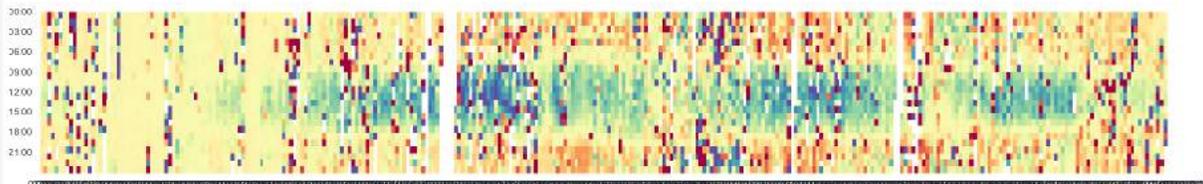
CH-AWS (hourly)



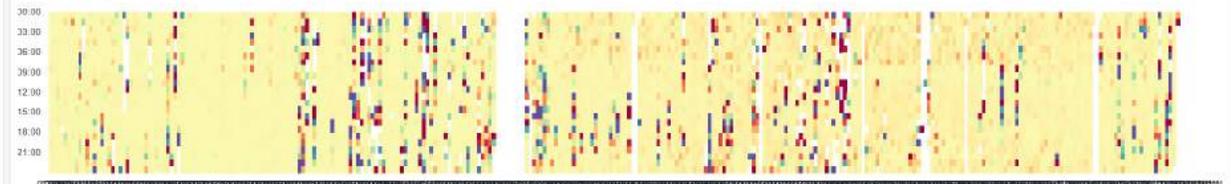
CH-DAV (hourly)



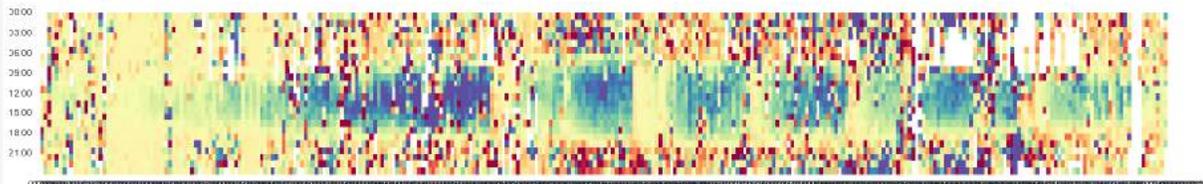
CH-FRU (hourly)



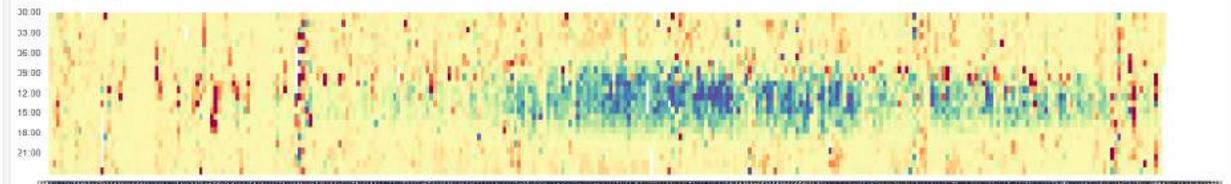
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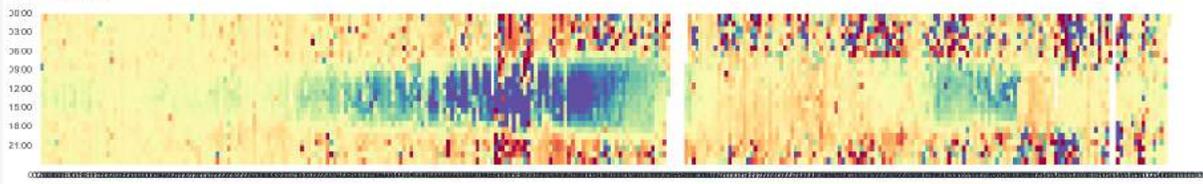
CH-CHA (hourly)



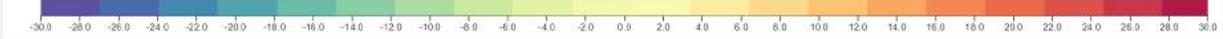
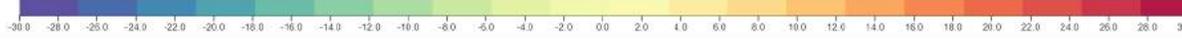
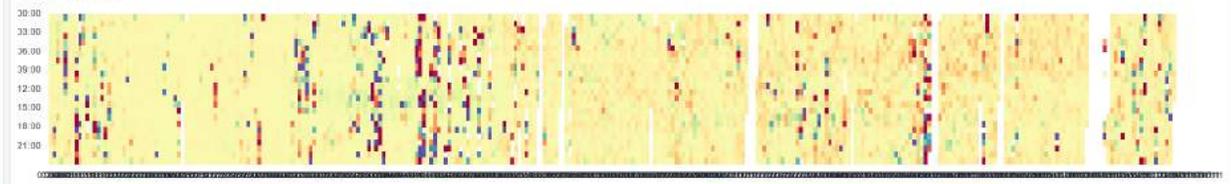
CH-LAE (hourly)



CH-OE2 (hourly)



CH-LAS (hourly)



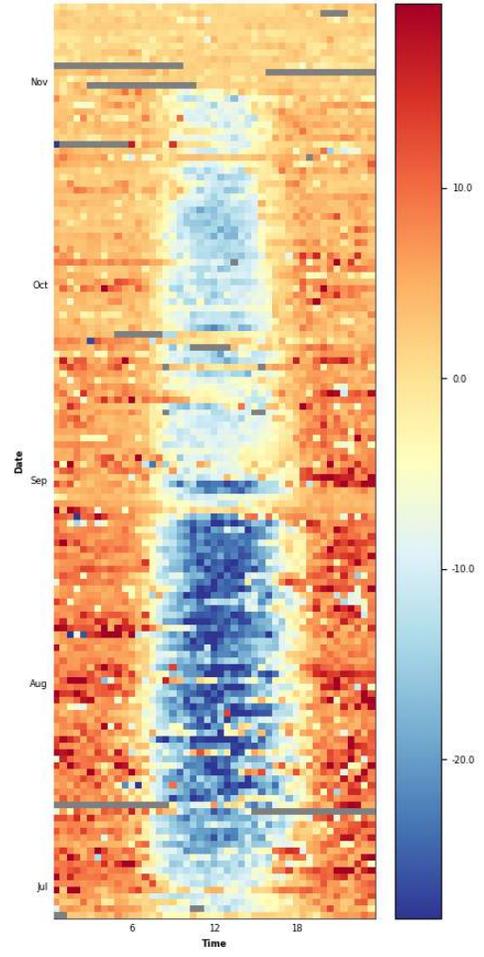
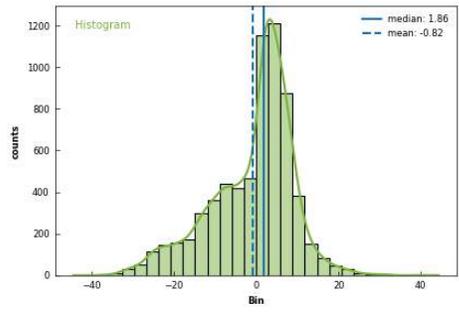
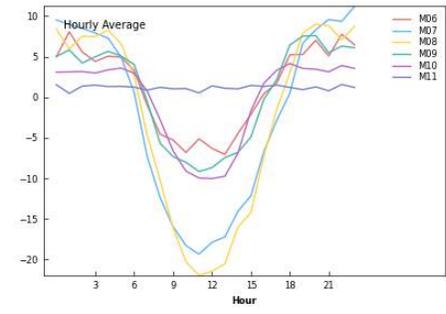
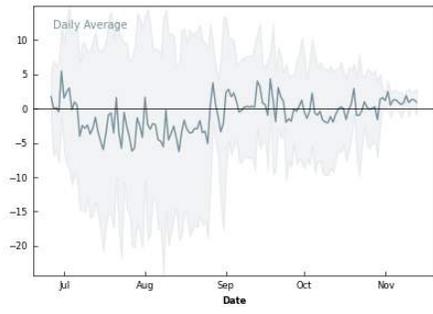
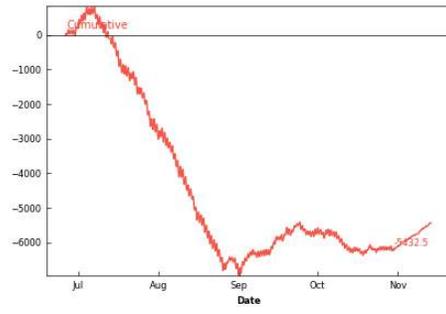
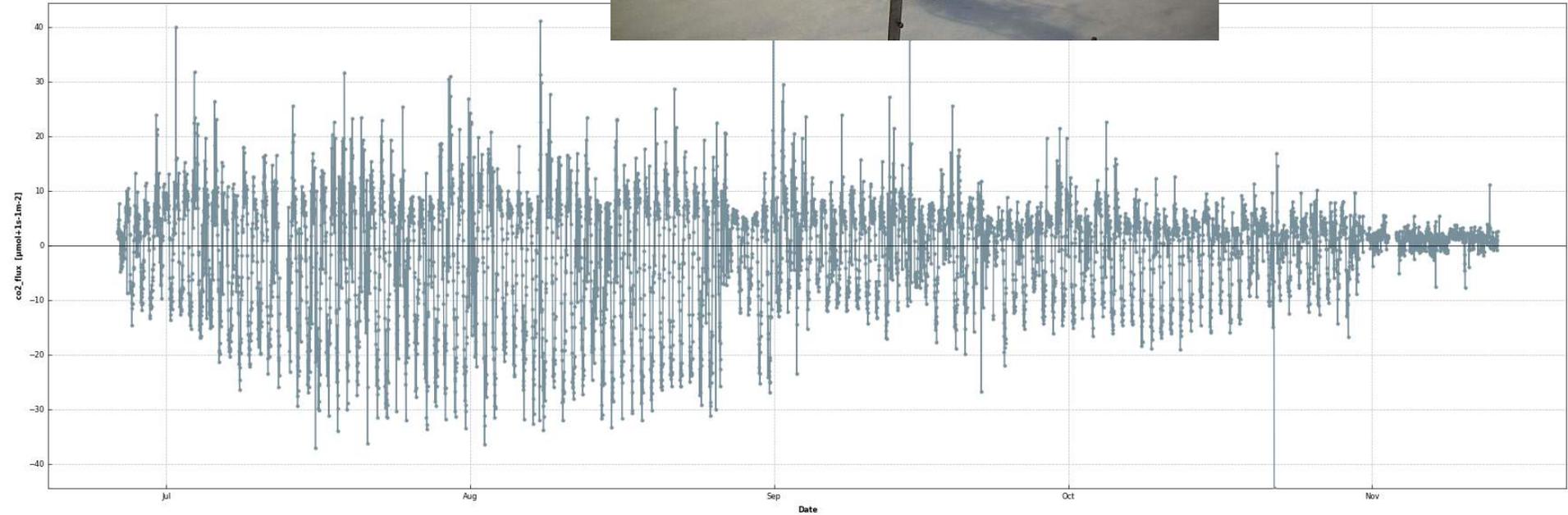
Not checked during this meeting

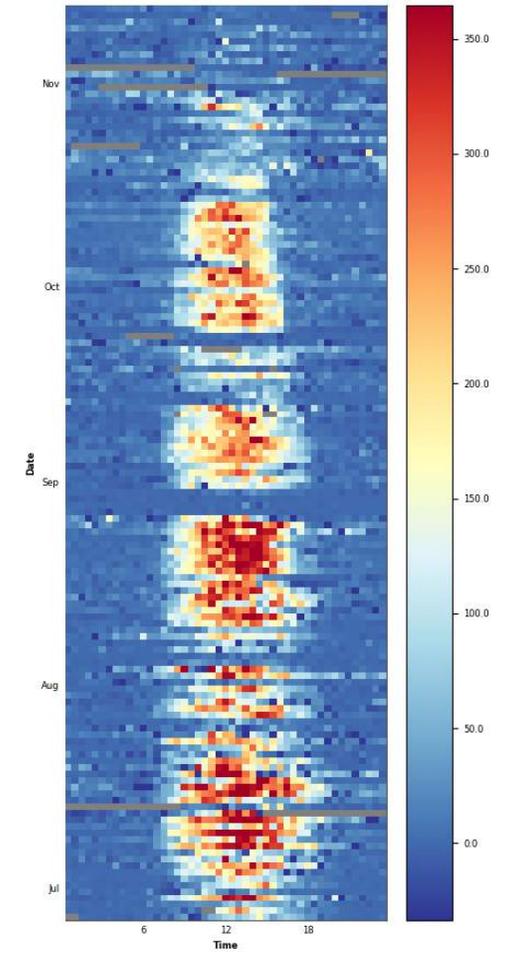
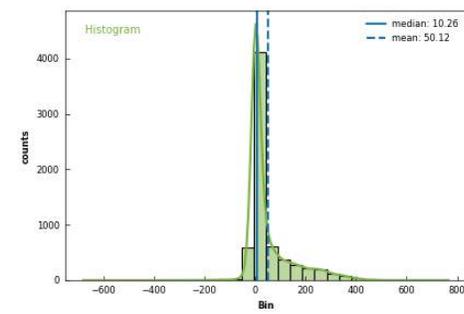
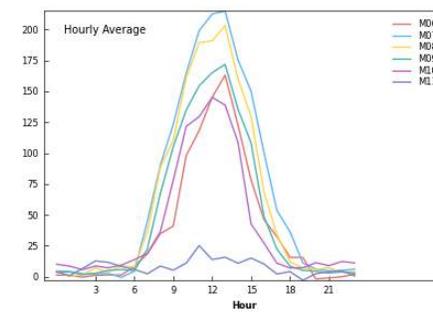
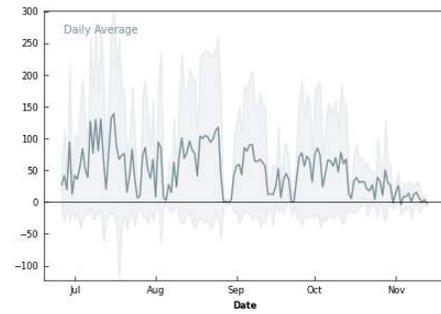
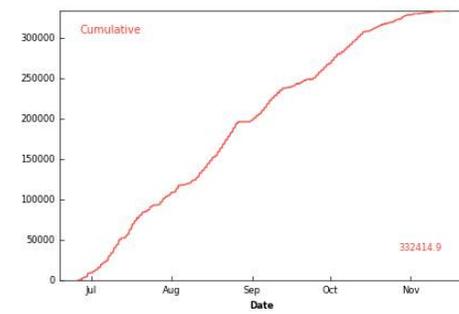
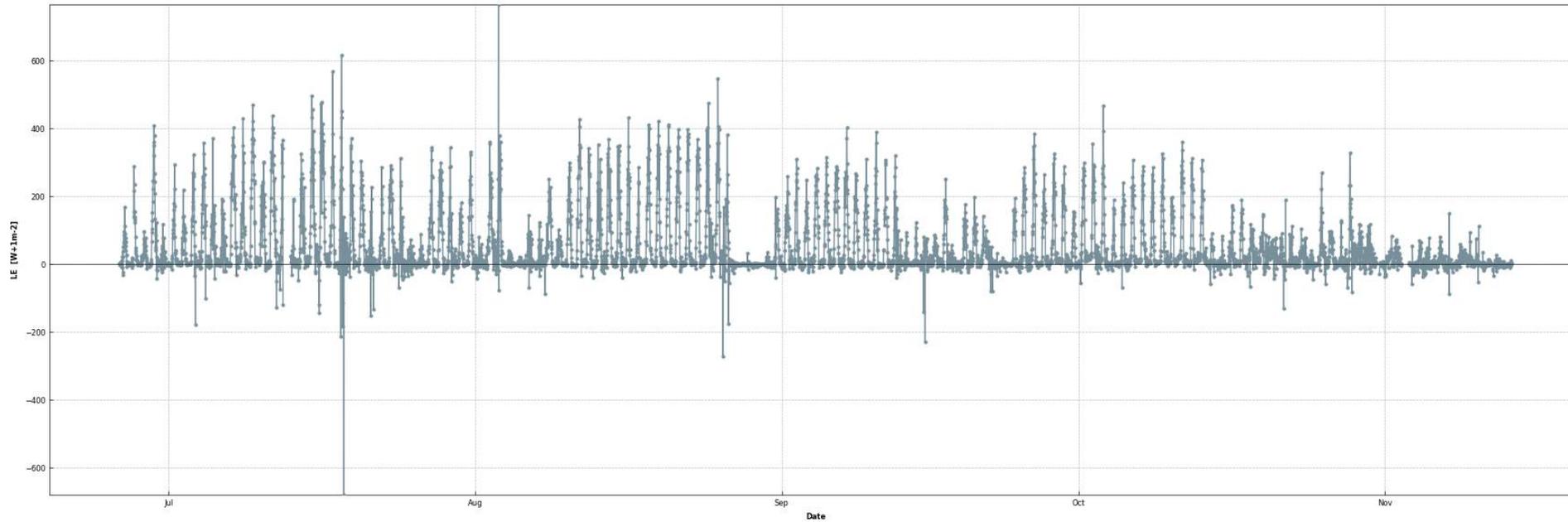


CH-AWS CO2 flux

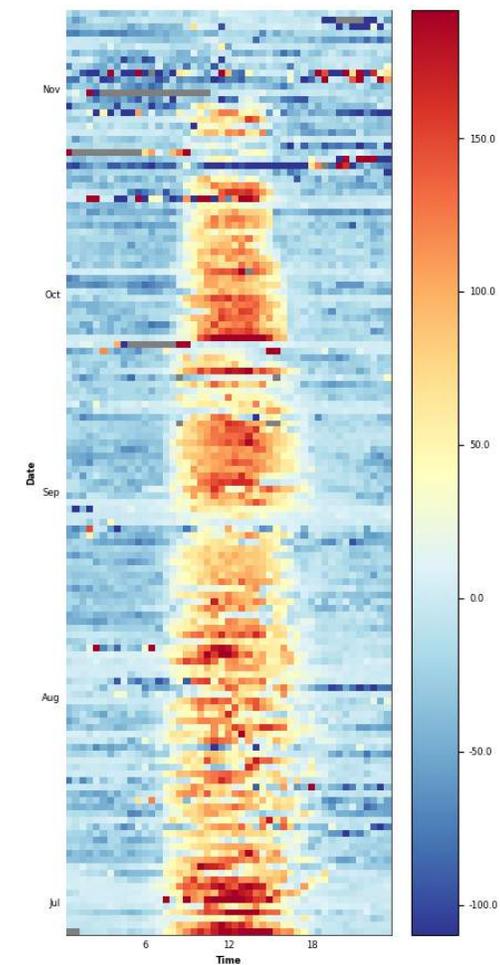
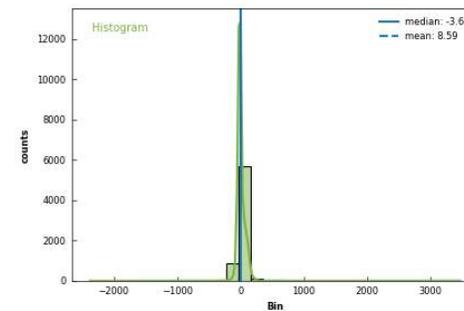
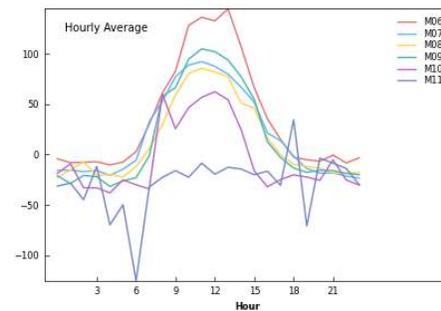
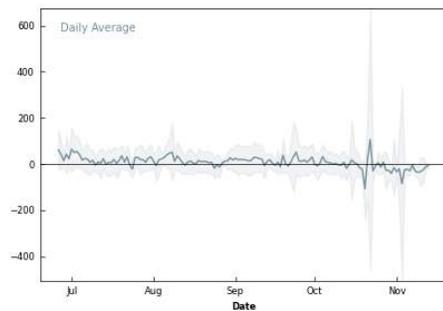
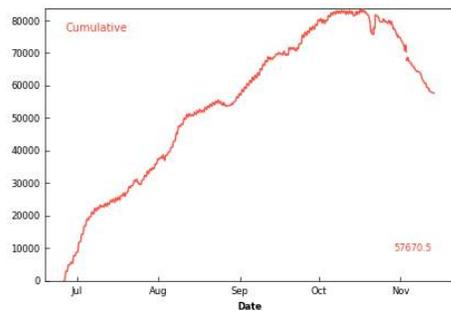
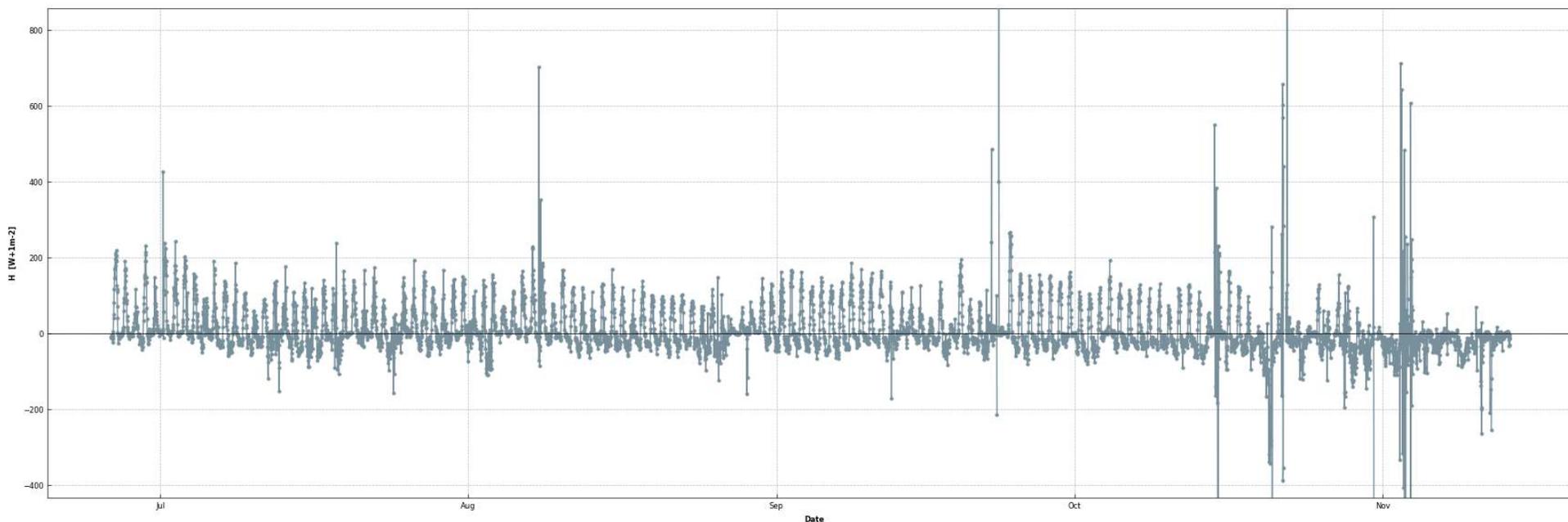


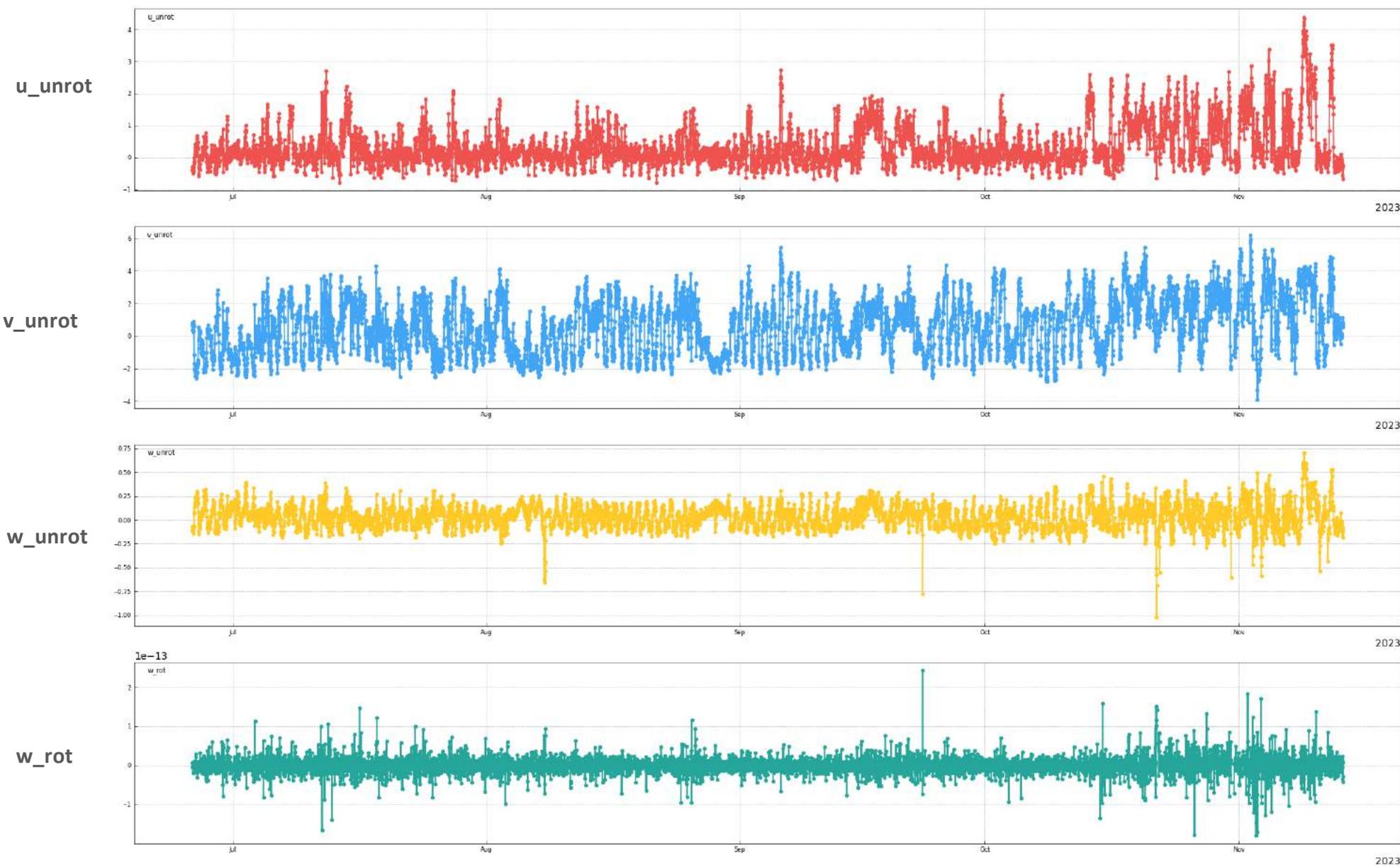
Most beautiful site & fluxes





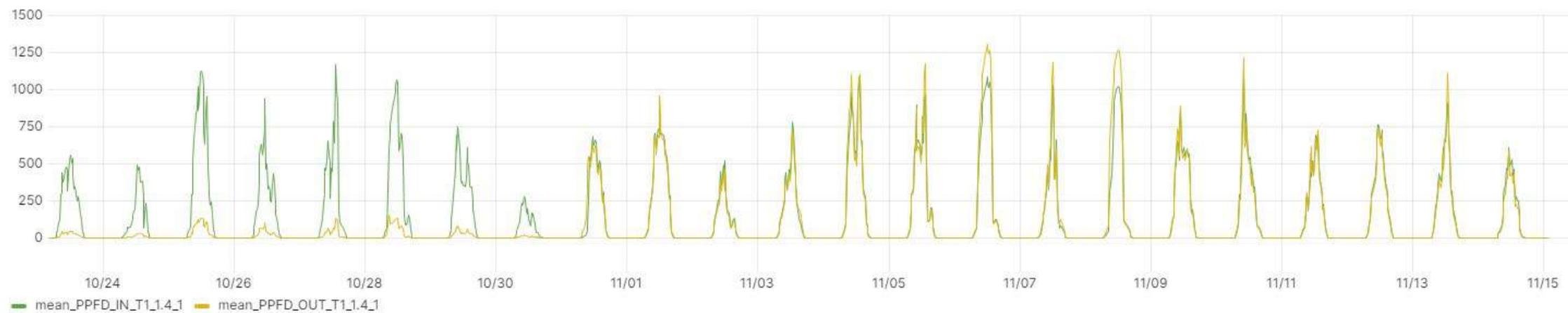
Snowfall causes high scatter





- PPFD OUT is higher than PPFD IN after snow came. One (or both?) of them need calibration

PPFD (all available for selected site)

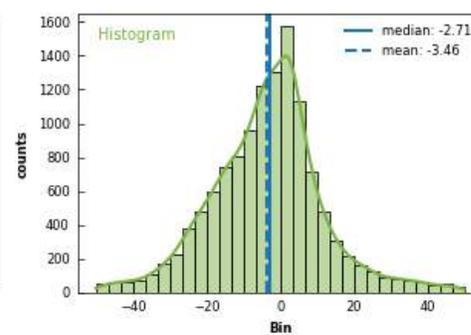
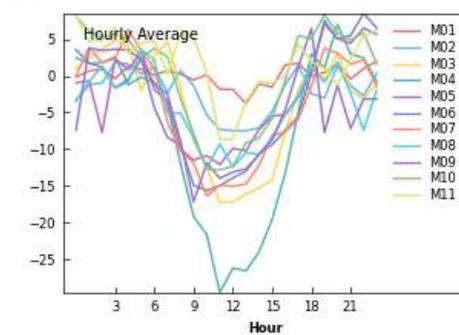
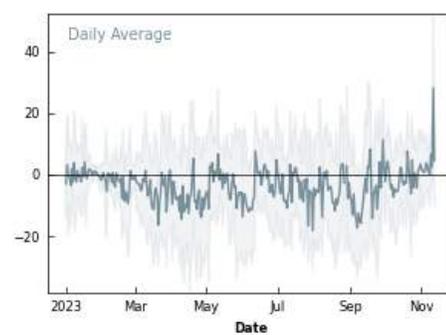
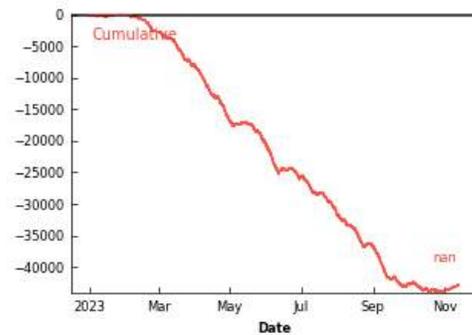
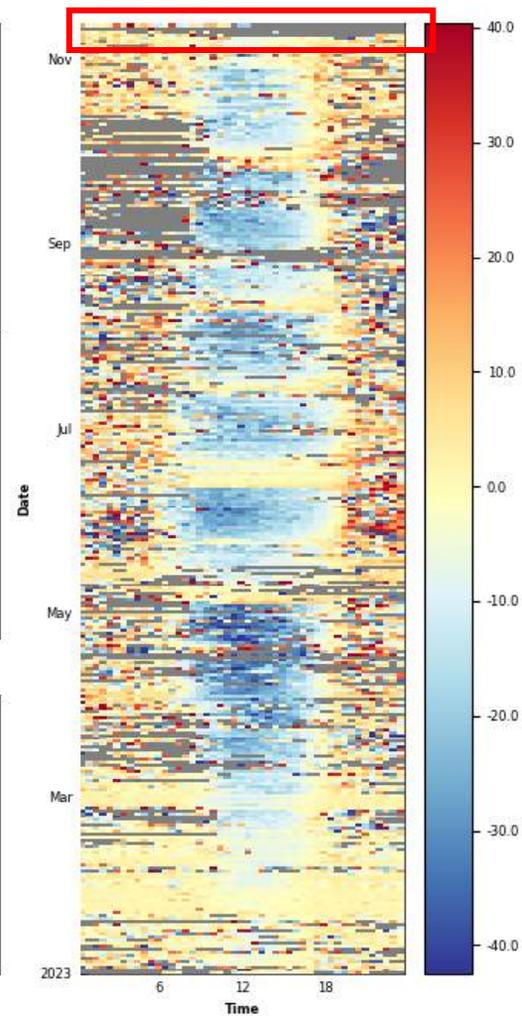
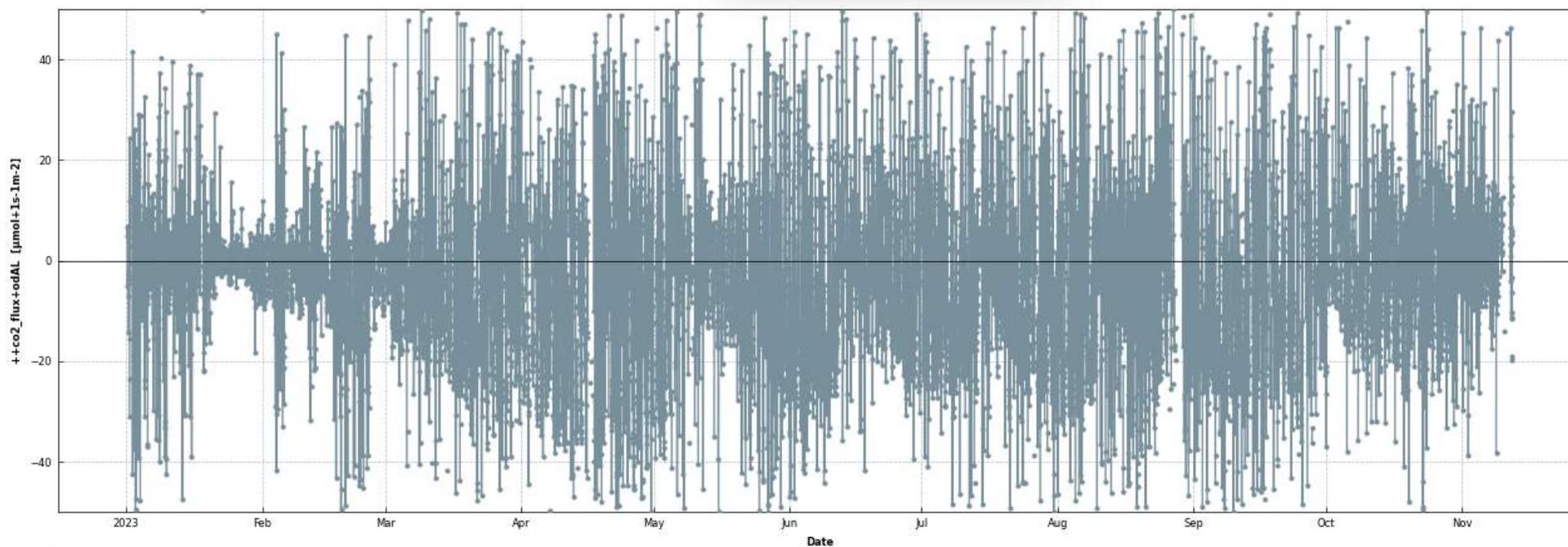


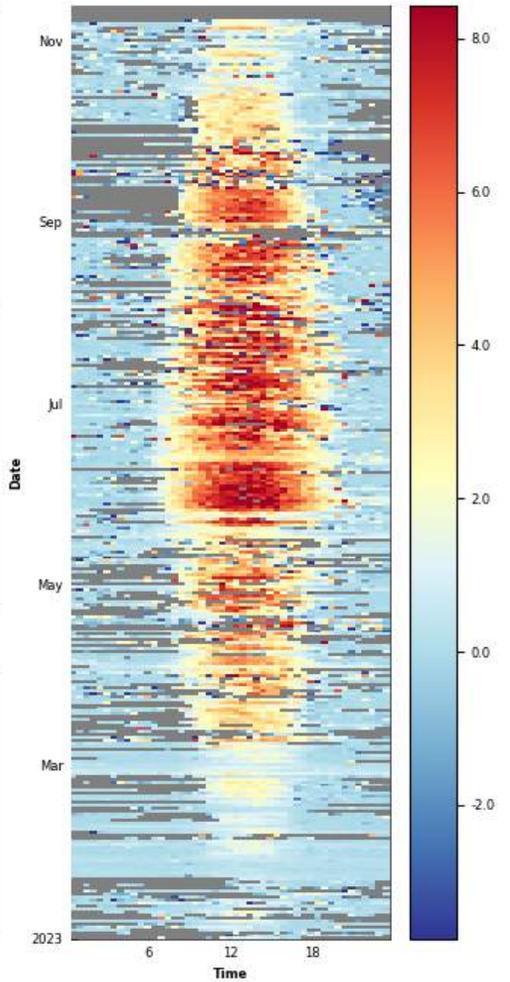
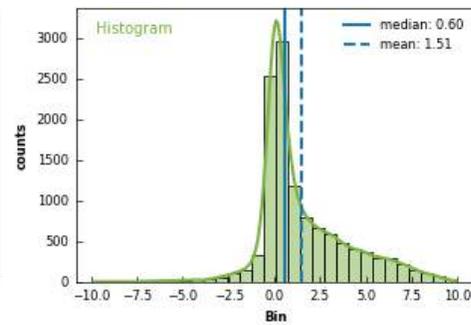
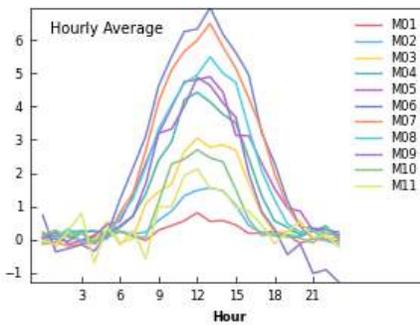
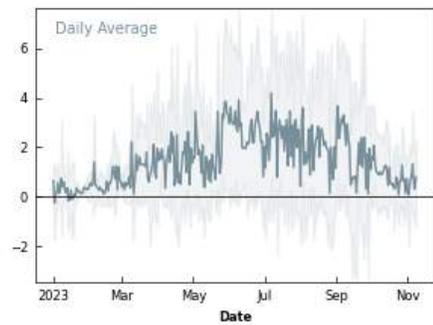
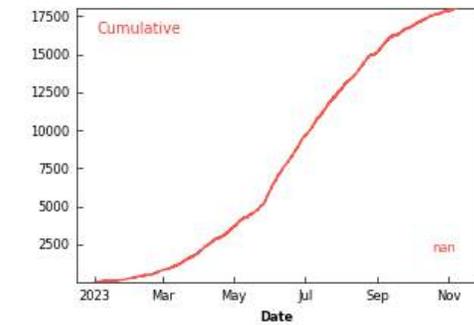
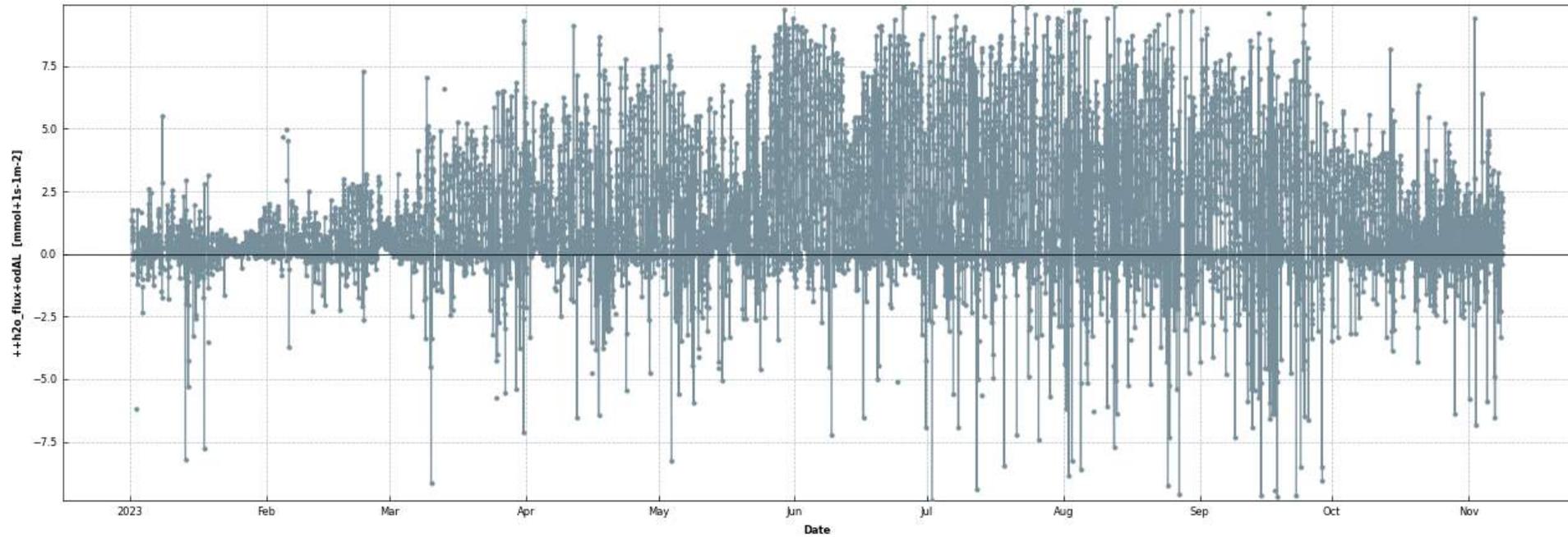


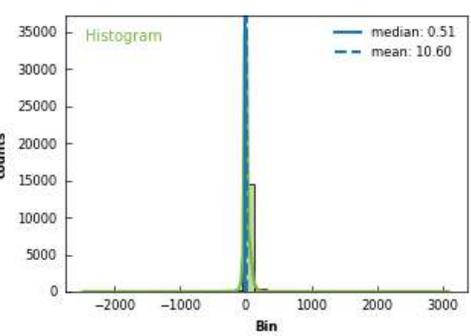
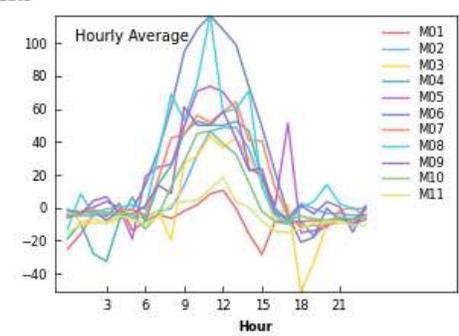
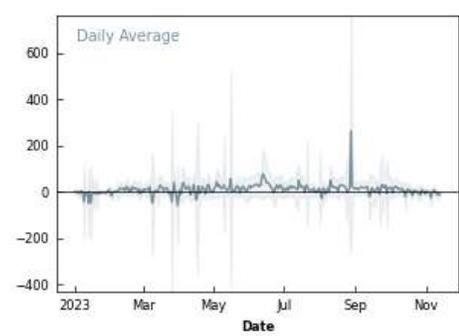
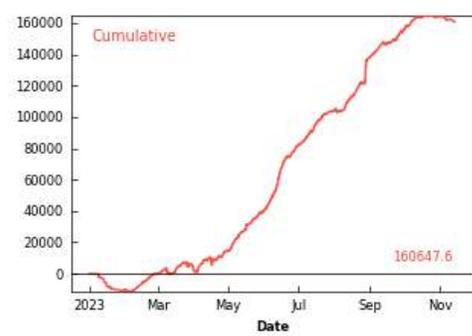
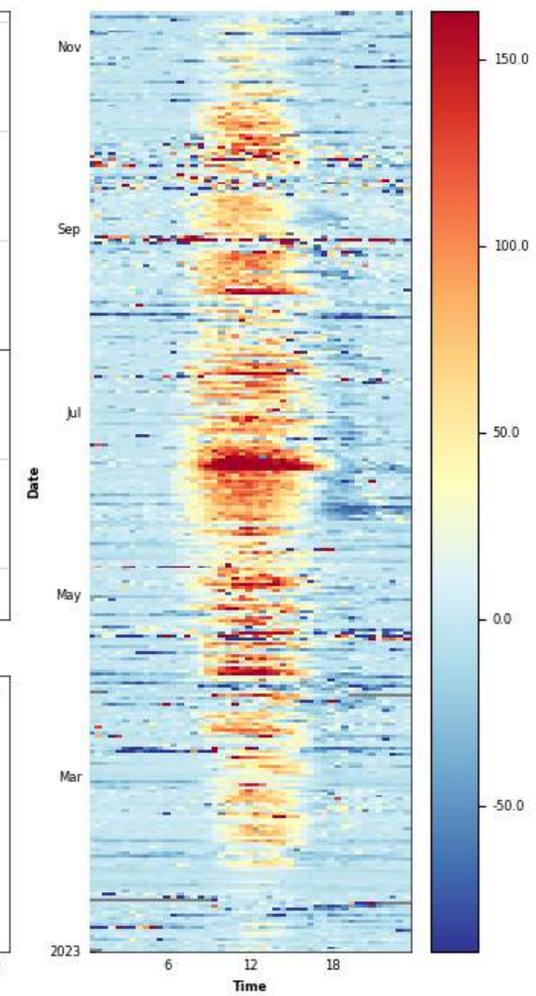
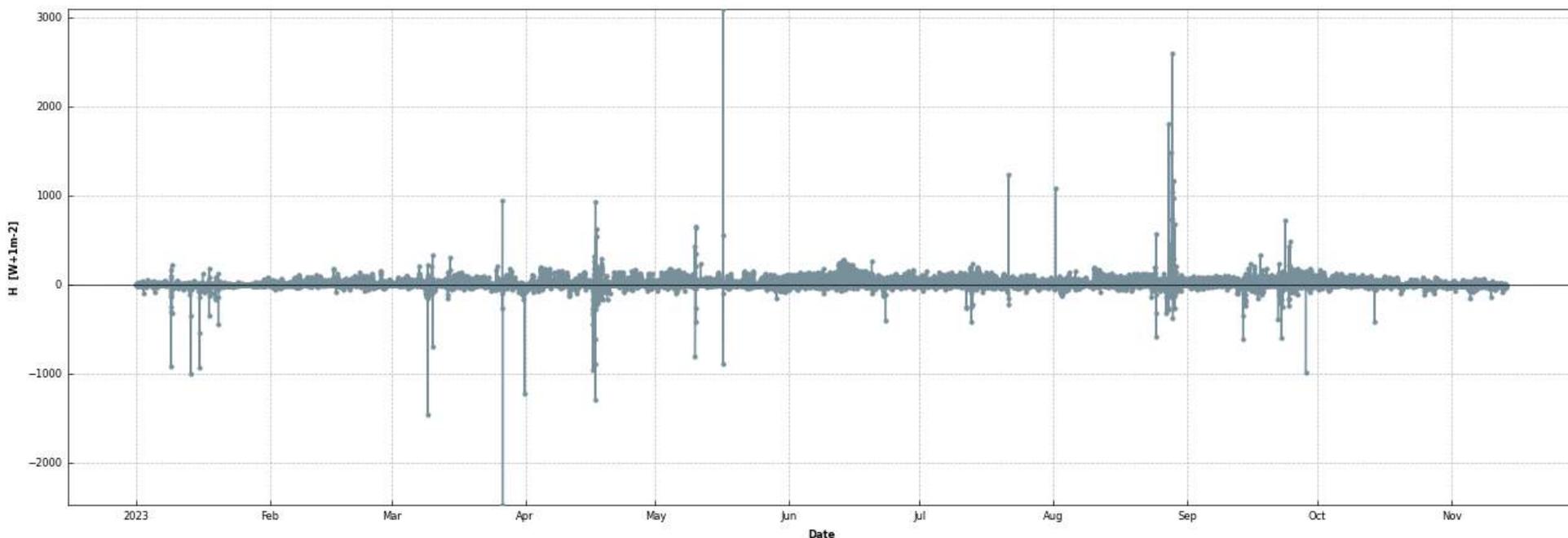


- 1st mowing: 2023.05.04
- 2nd mowing: 2023.06.11
- 3rd mowing: 2023.07.13
- 4th mowing: 2023.08.08
- 5th mowing: 2023.09.25
- 6th mowing: 2023.10.28

Sometimes results from automatic flux calculations contain lots of NAs and -9999. Normally the results look okay if the calculation is started manually.







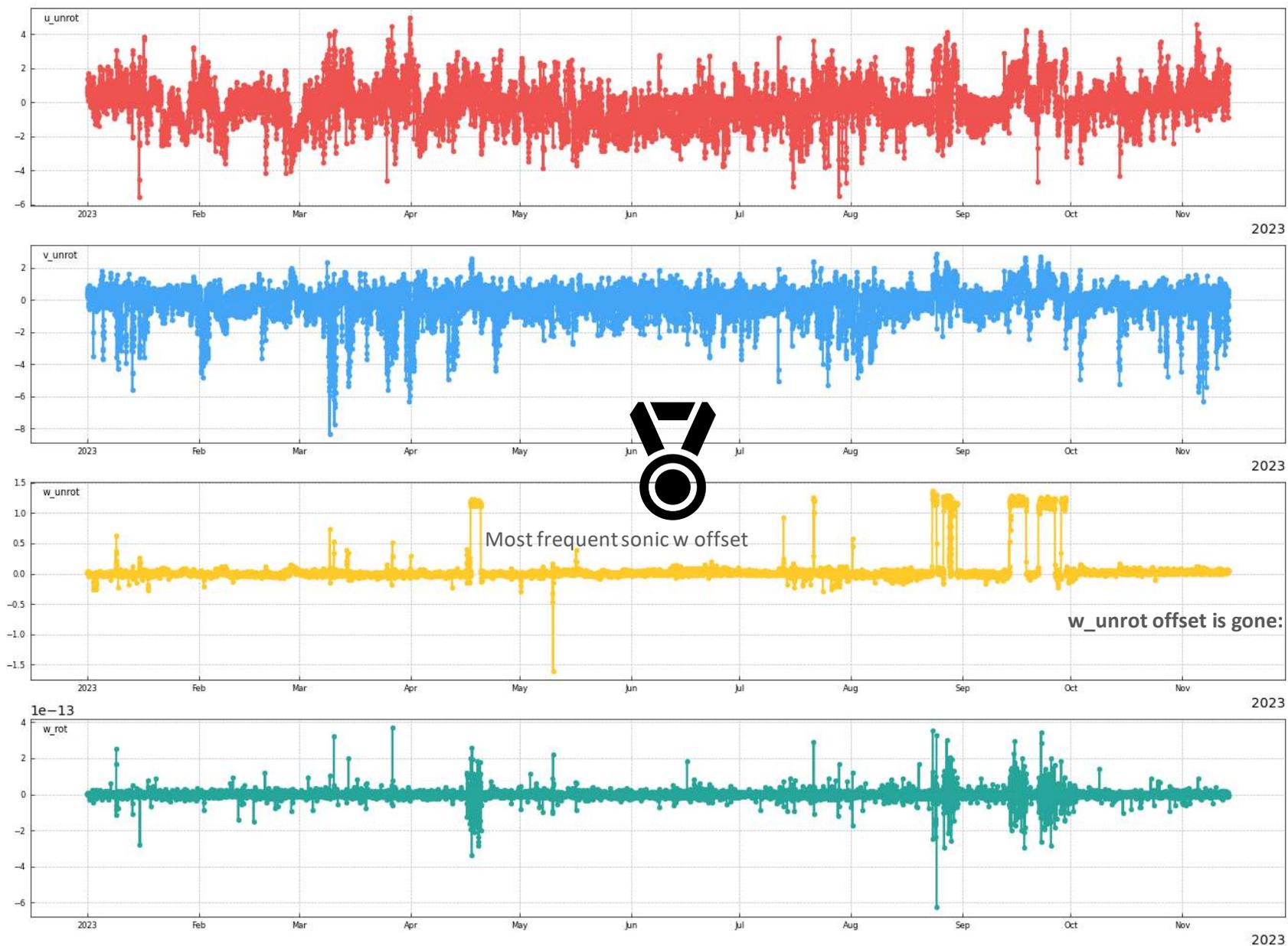
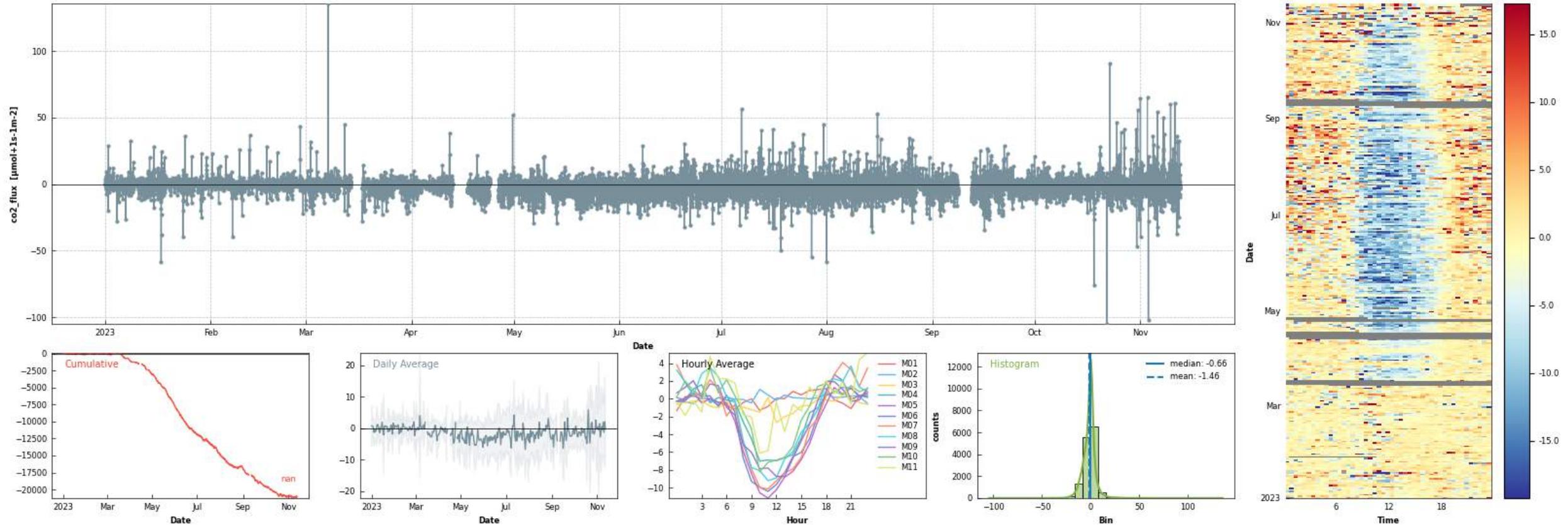
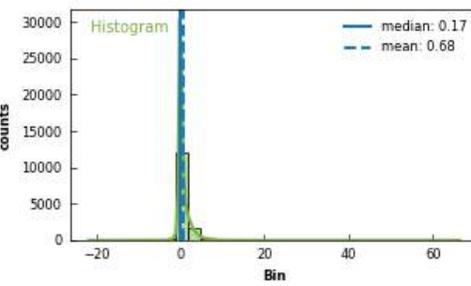
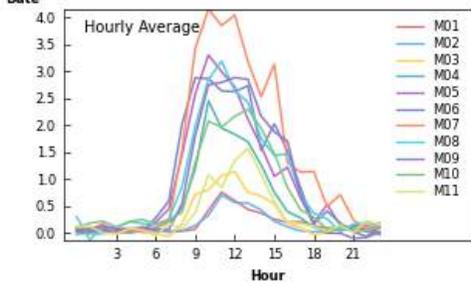
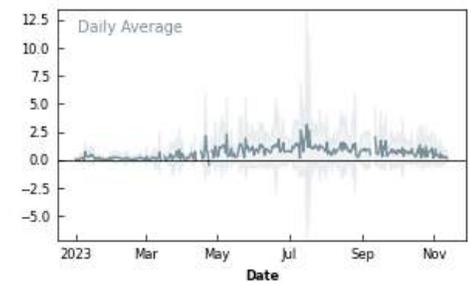
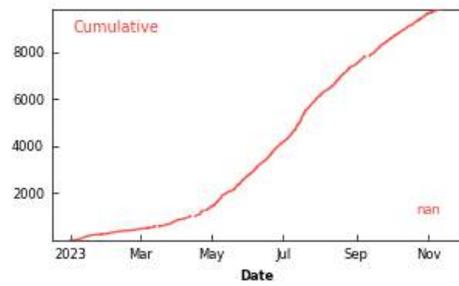
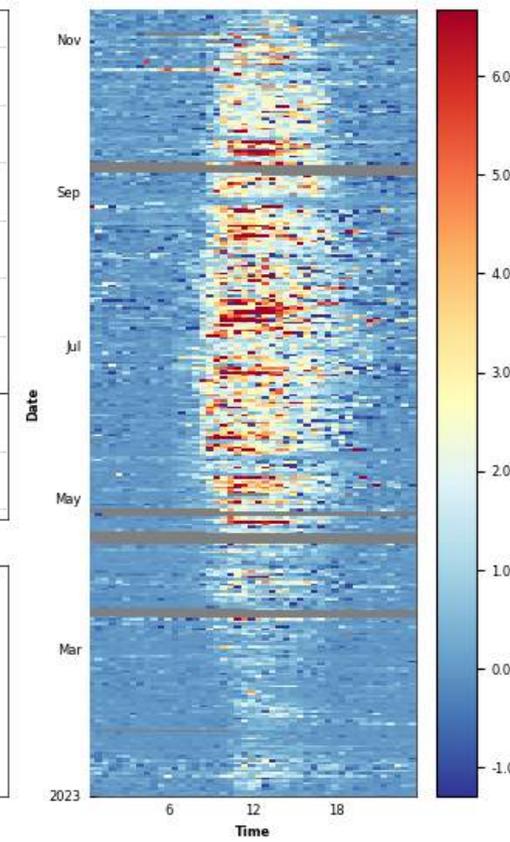
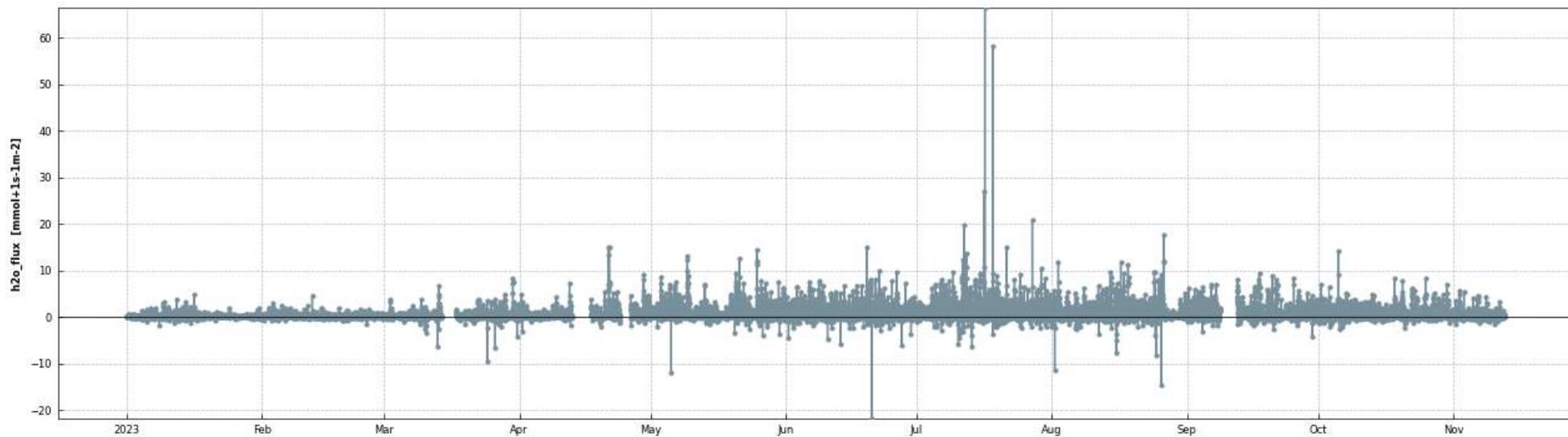


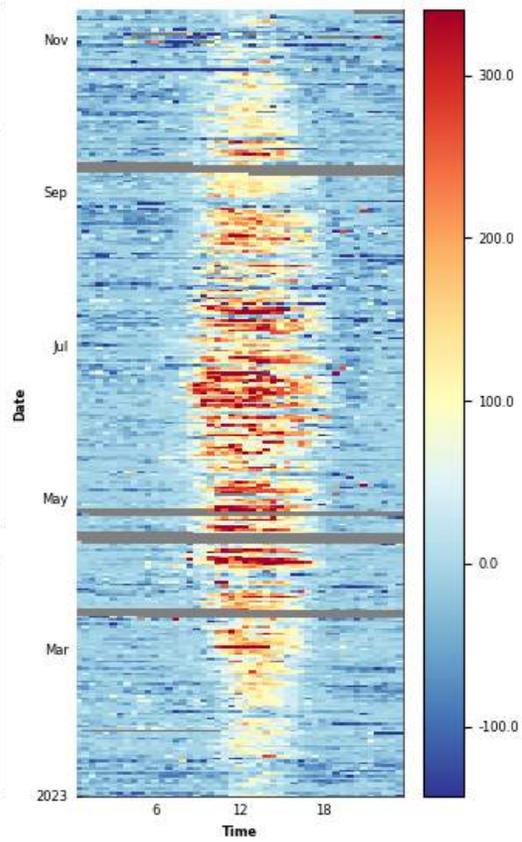
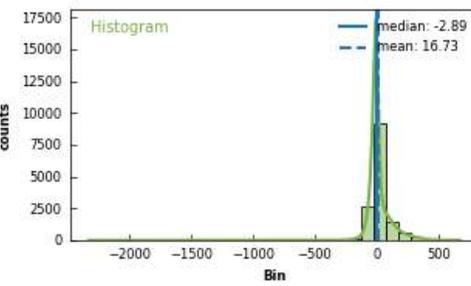
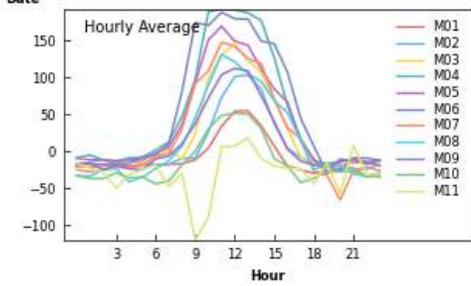
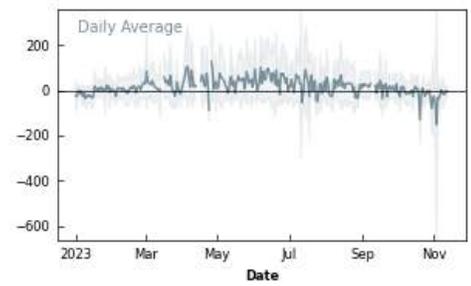
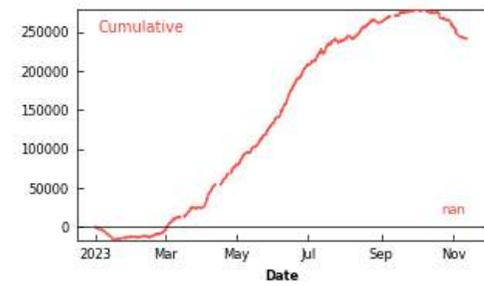
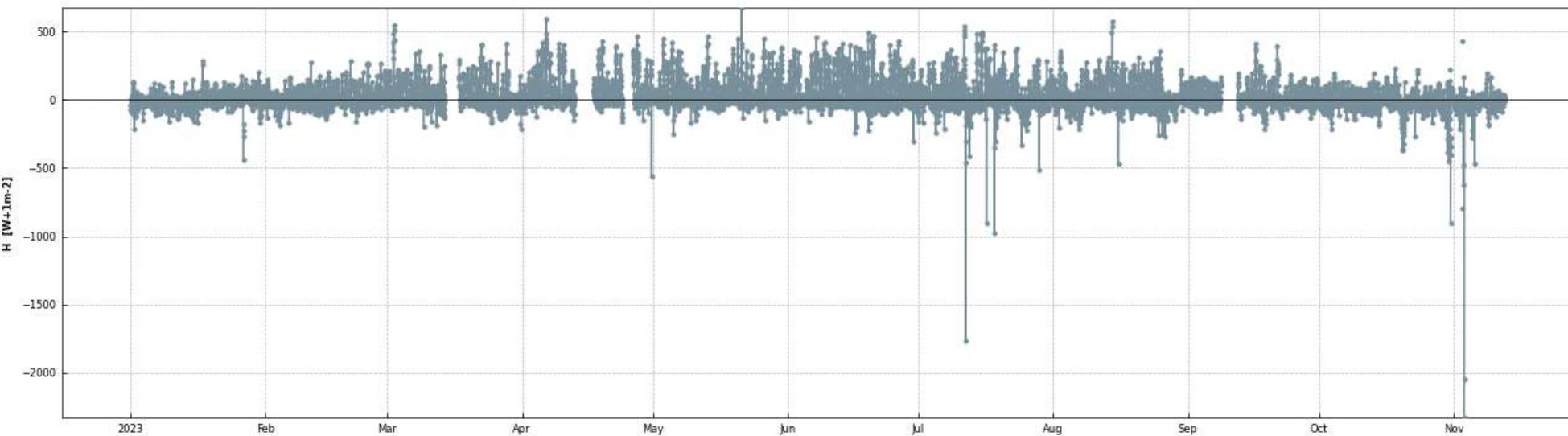


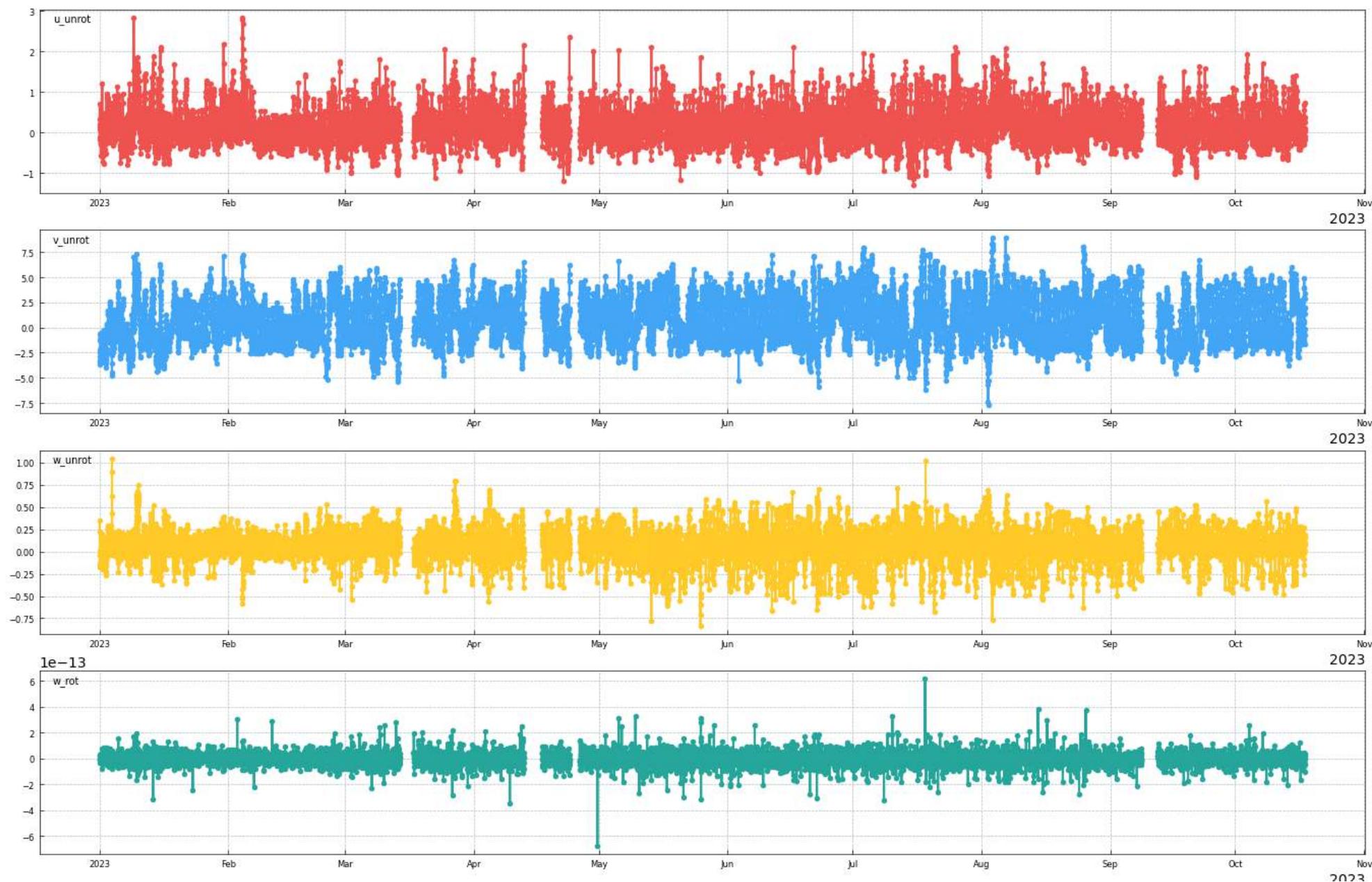
Photo: Lukas Hörtnagl

- Noisy period end of October, beginning of November. Bad weather?
- First snow









- Albedo (SW_OUT/SW_IN) might be a better indicator
- Average albedo at Davos ~ 0.06, rather constant (at noon)
- During periods with snow cover SW_OUT and albedo increases

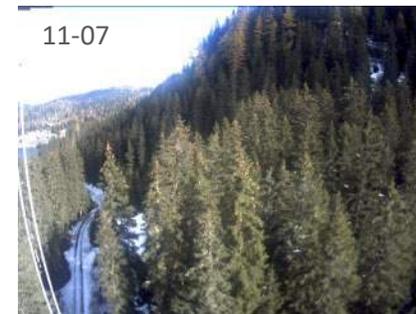
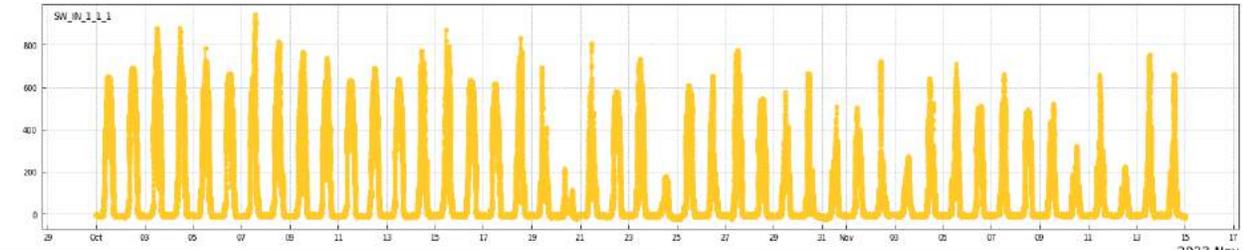
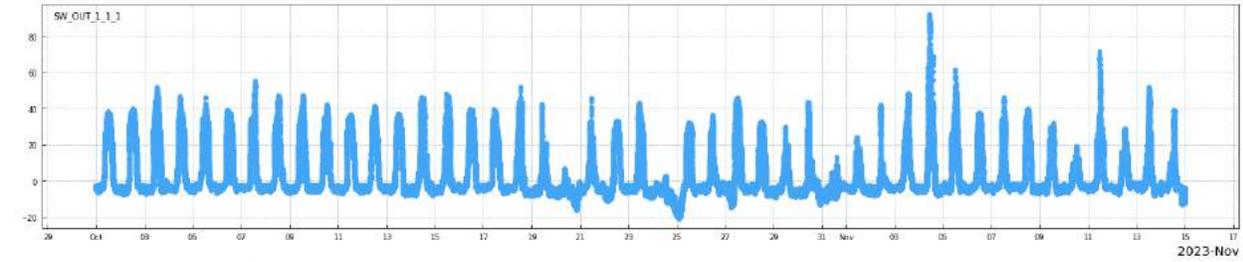
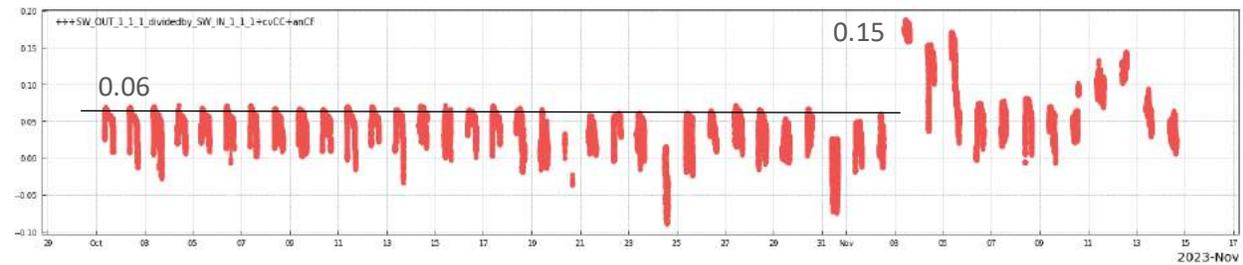
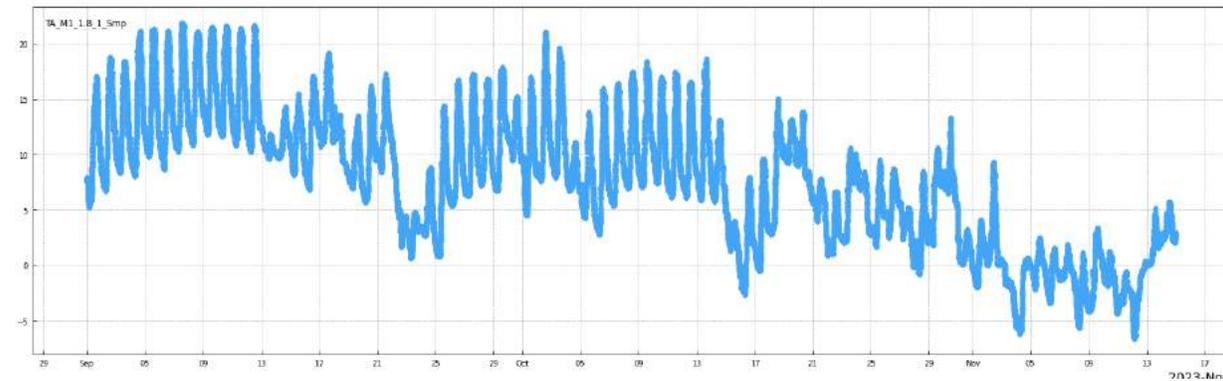
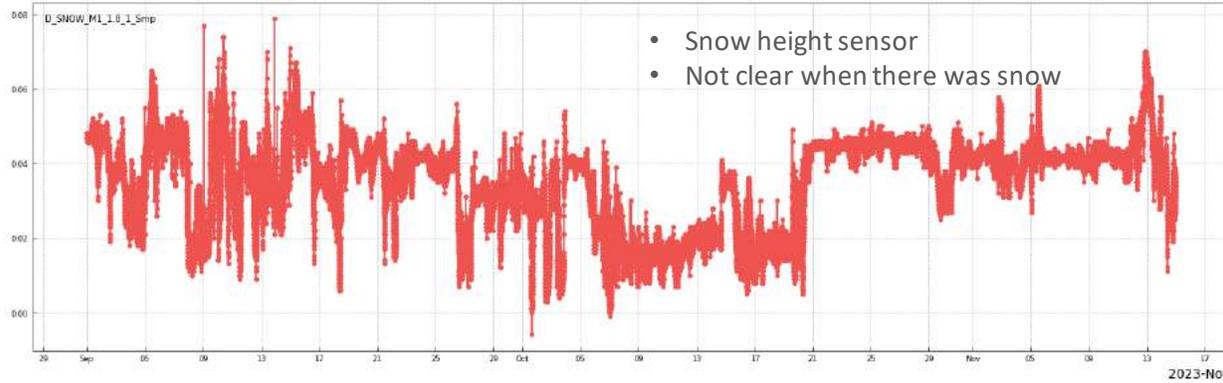


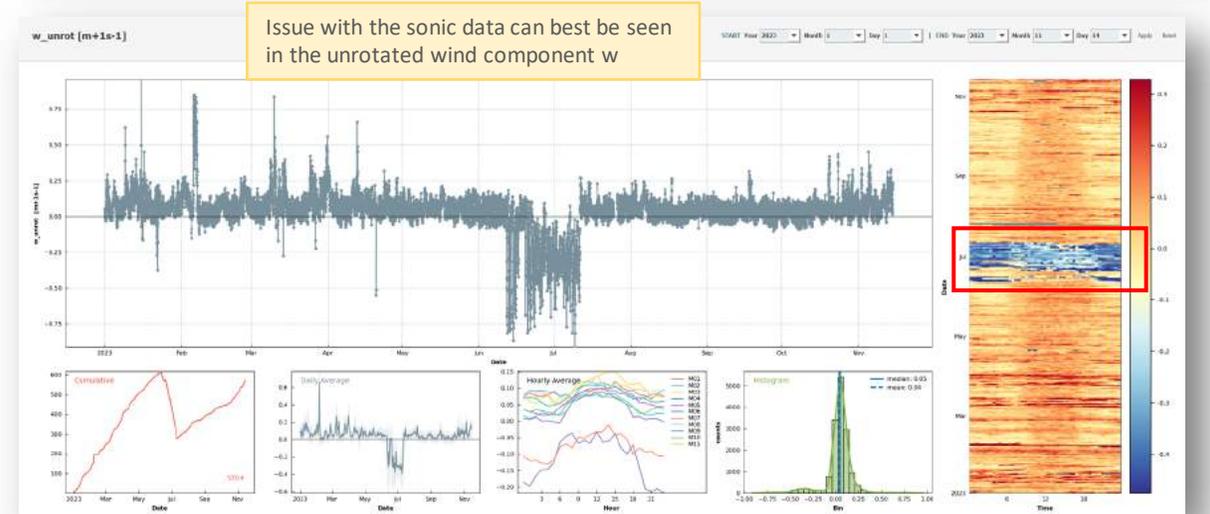
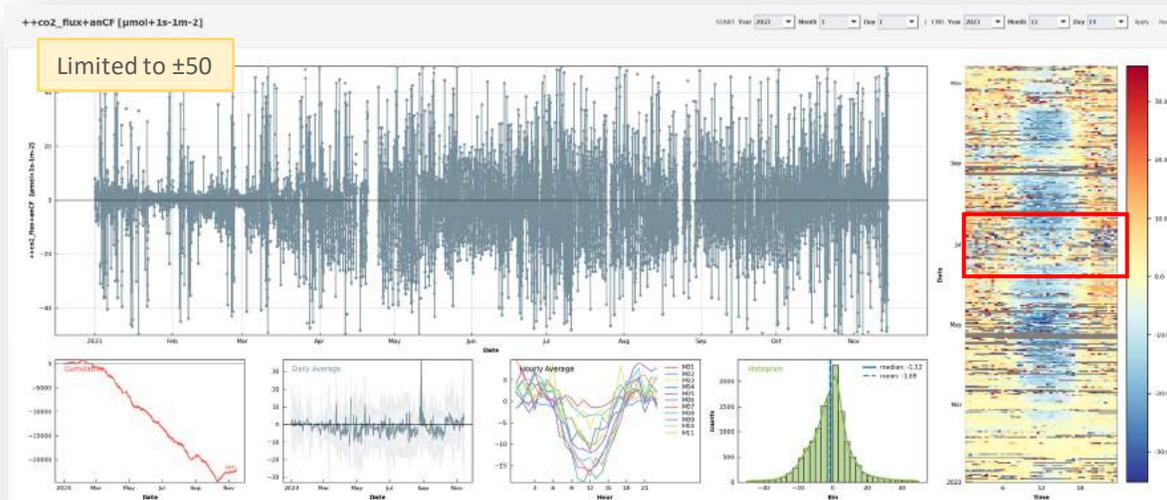
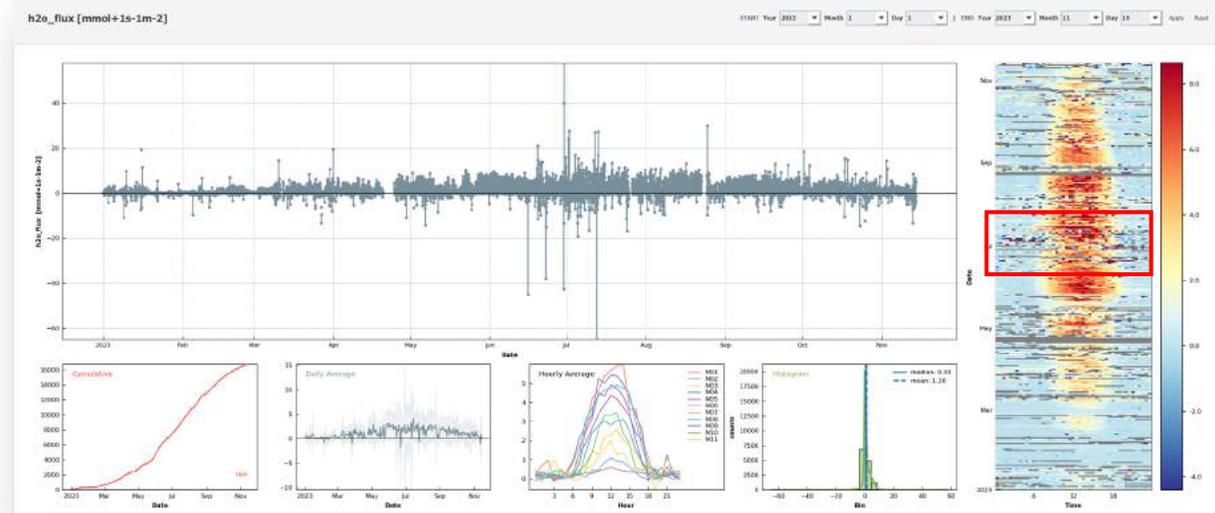
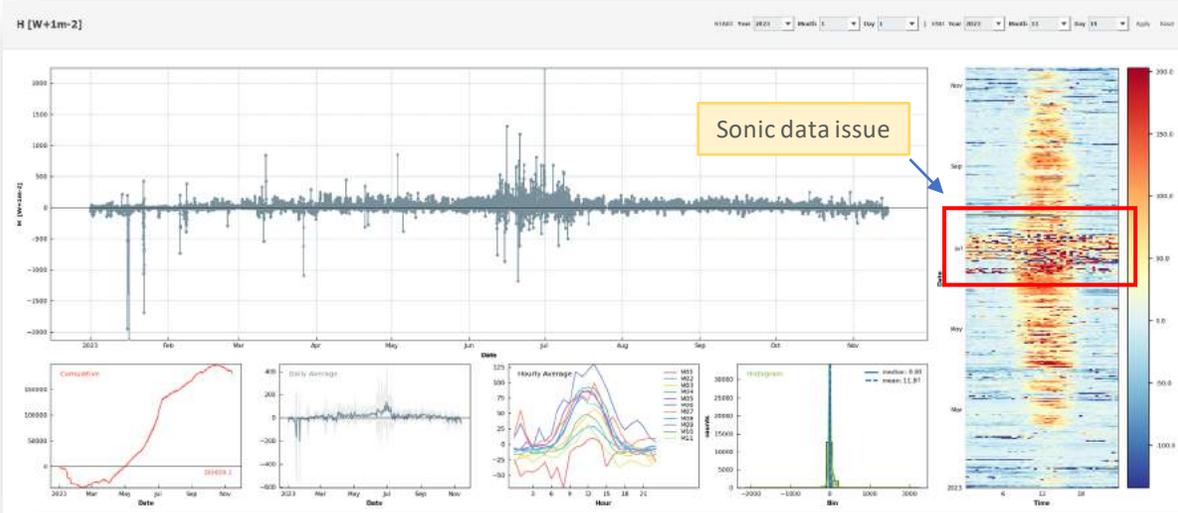


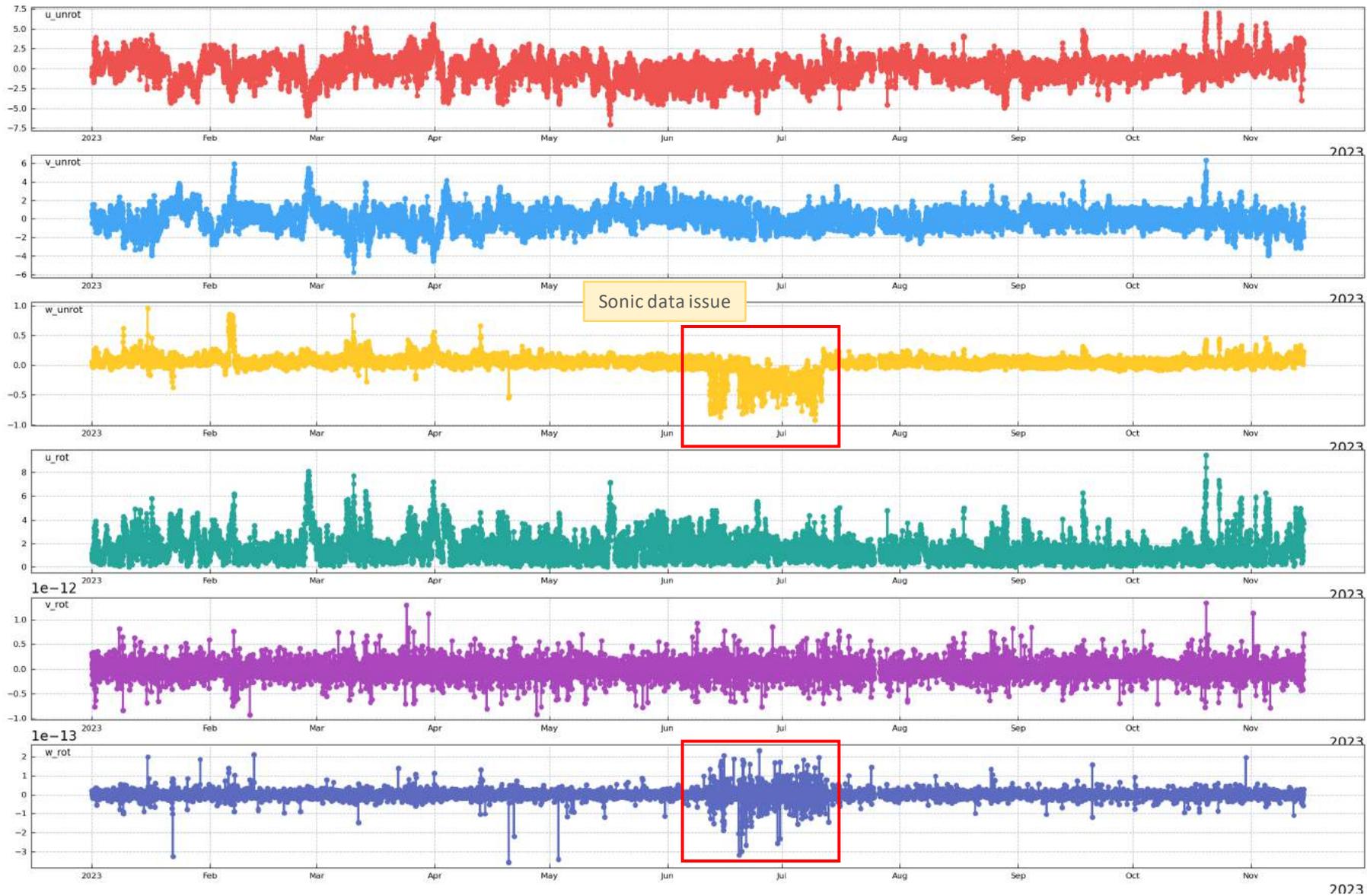
Photo: Luana Krebs

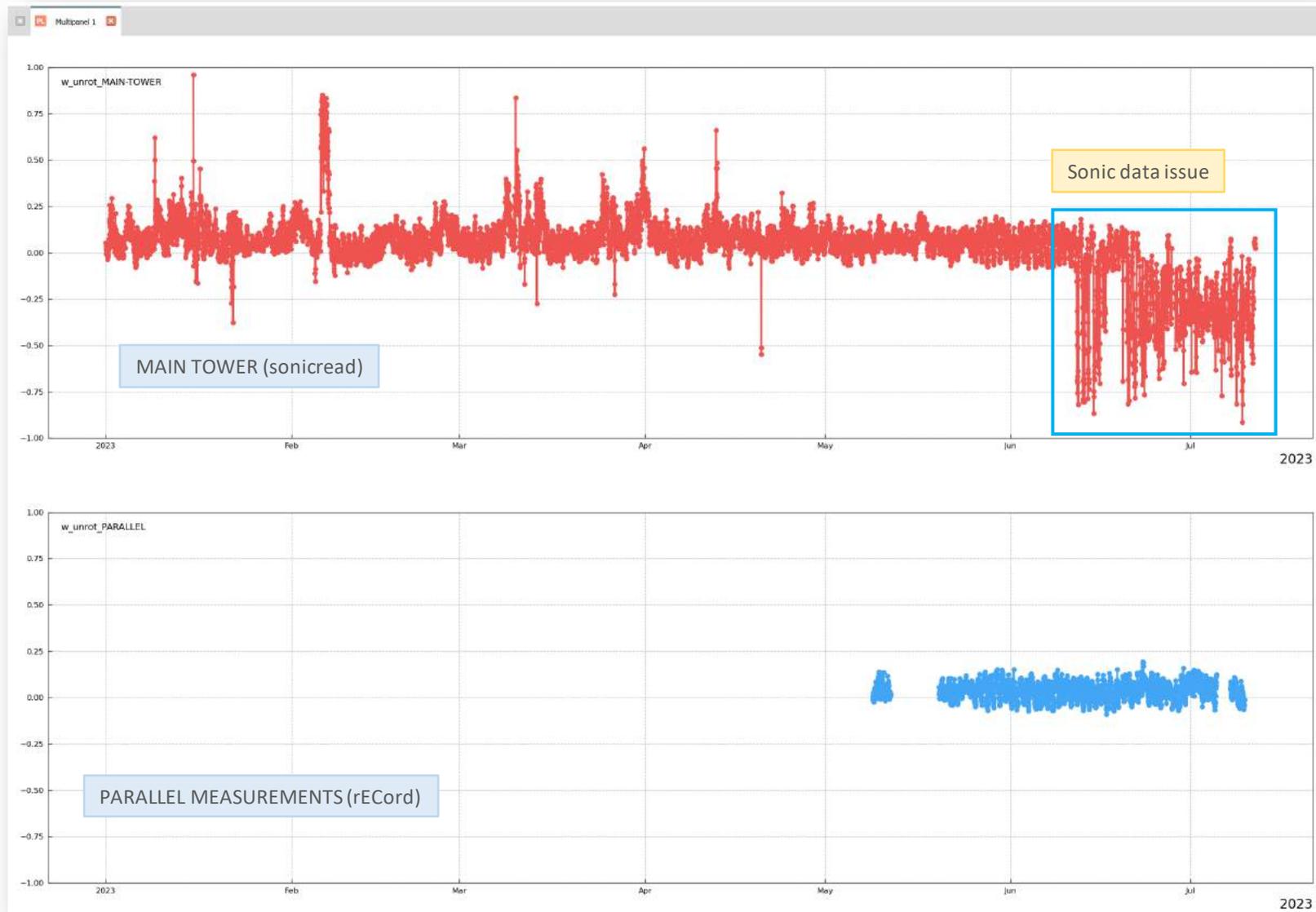
Not checked during this meeting



Photo: Lukas Hörtnagl







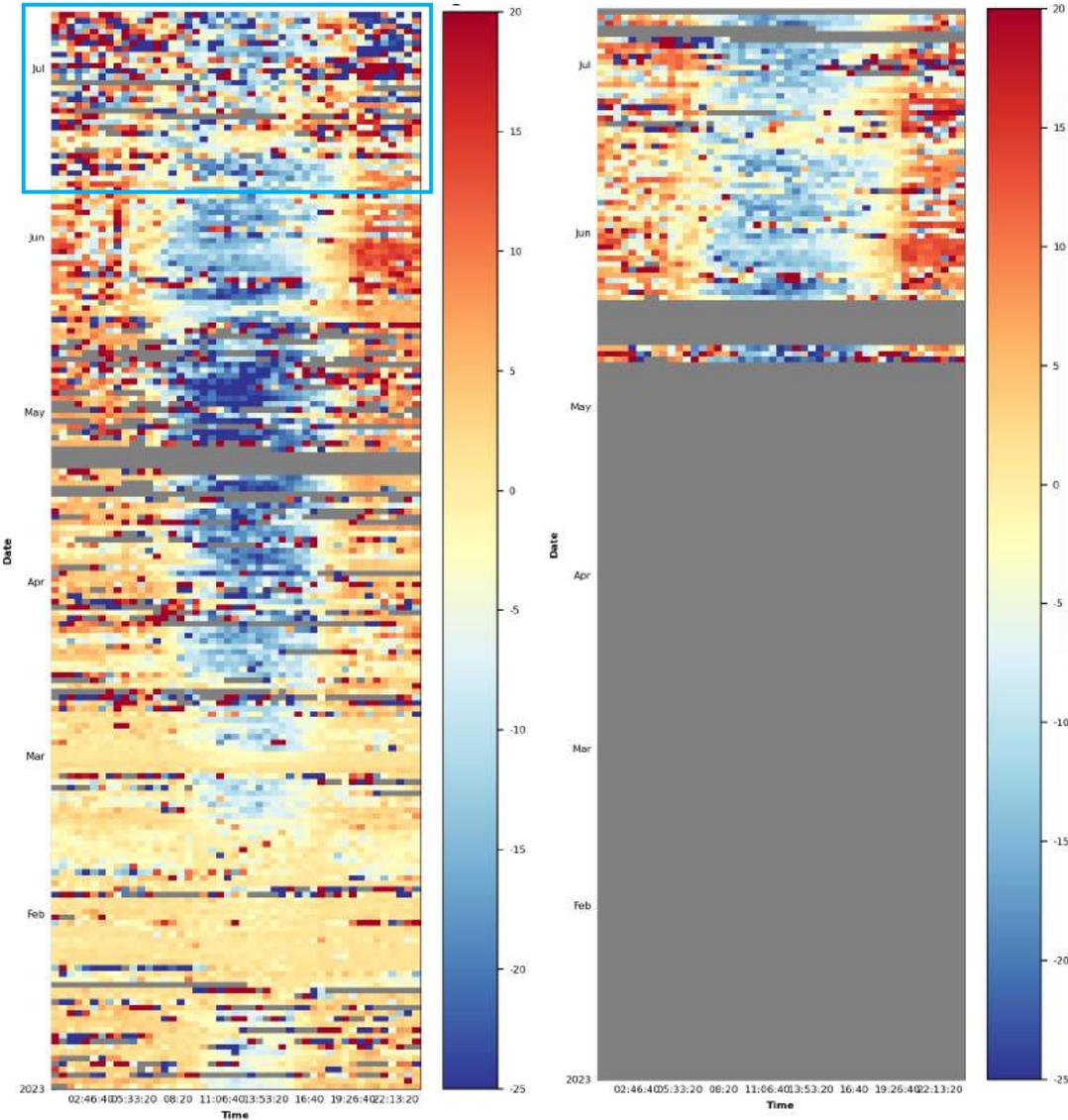
- Issues with sonic data started on 12 Jun 2023
- But sonic data from parallel measurements look good

CH-FRU_GF1_1_1-202307111230.jpg



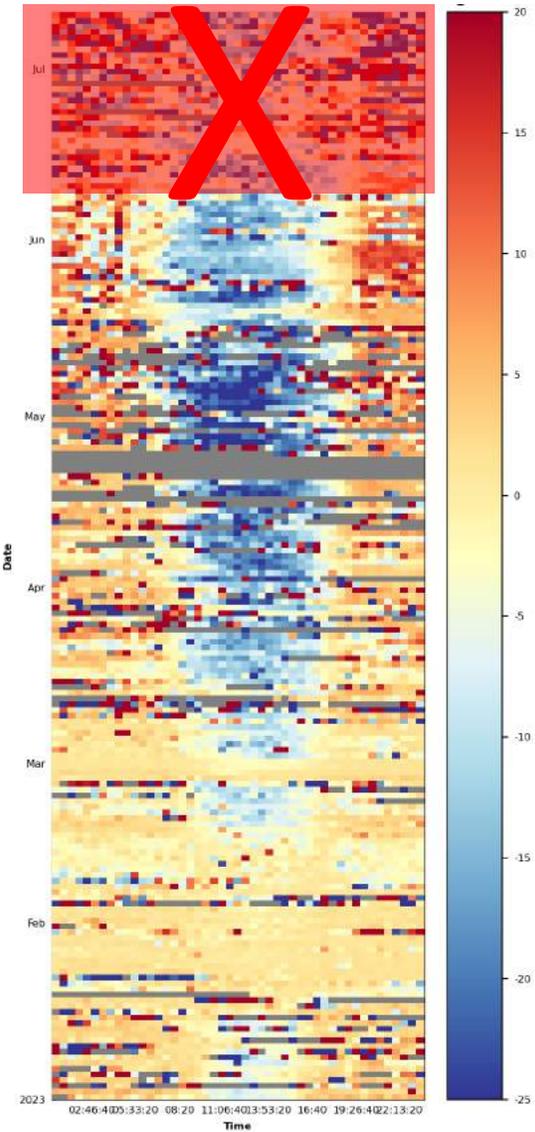
MAIN TOWER (sonicread)

PARALLEL MEASUREMENTS (rECord)



- Both systems measure similar fluxes under normal (no issues) conditions
- We can merge the two time series to one complete time series
- The parallel system replaces data from the main system from 12 Jun onwards (see next slide)

MAIN TOWER (sonicread)



PARALLEL MEASUREMENTS (rECord)

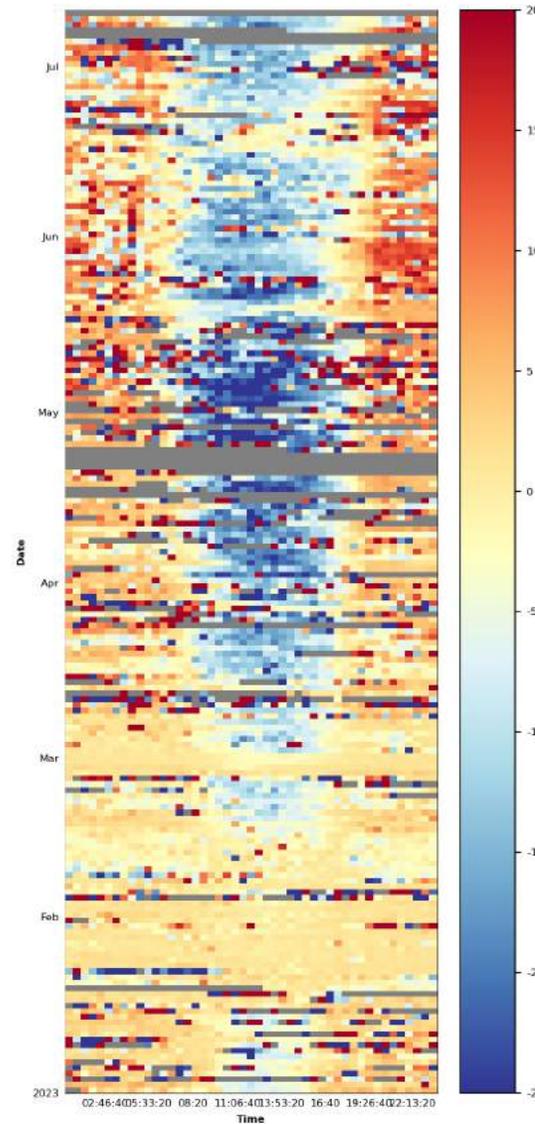
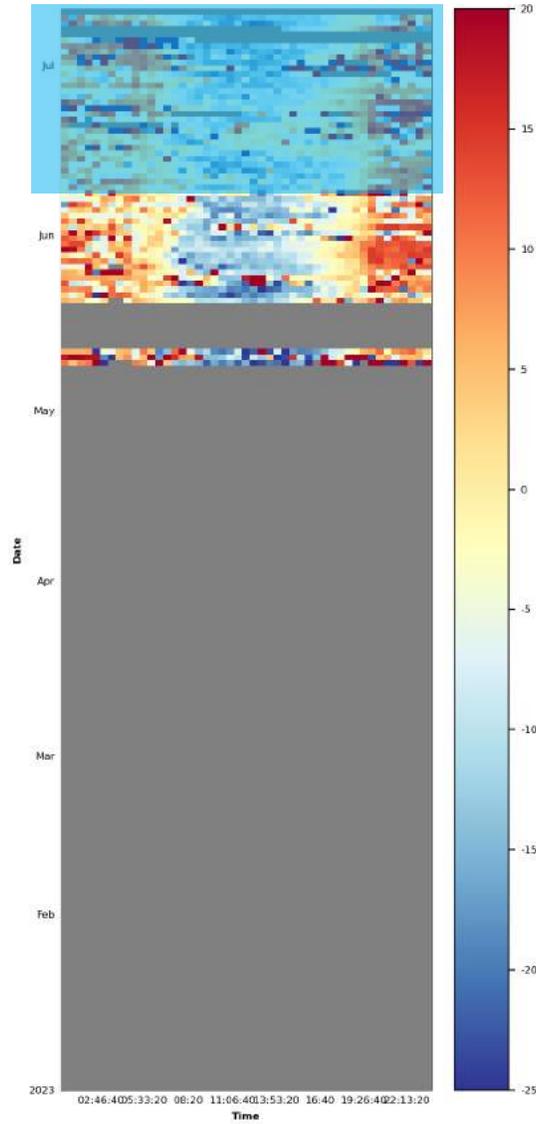
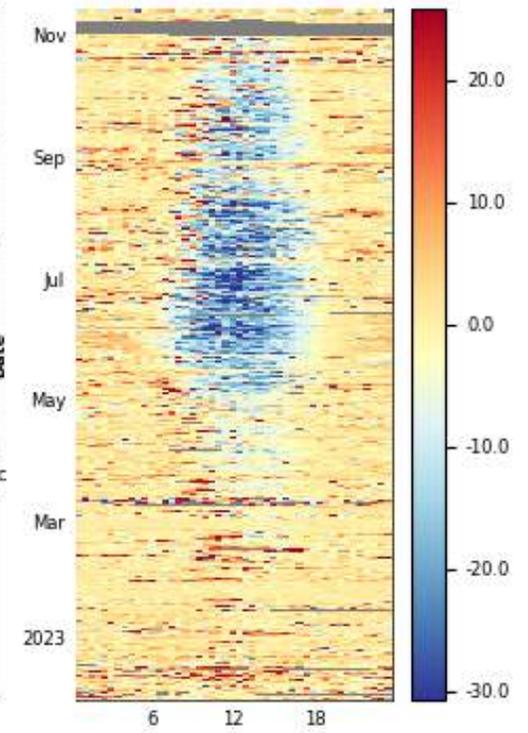
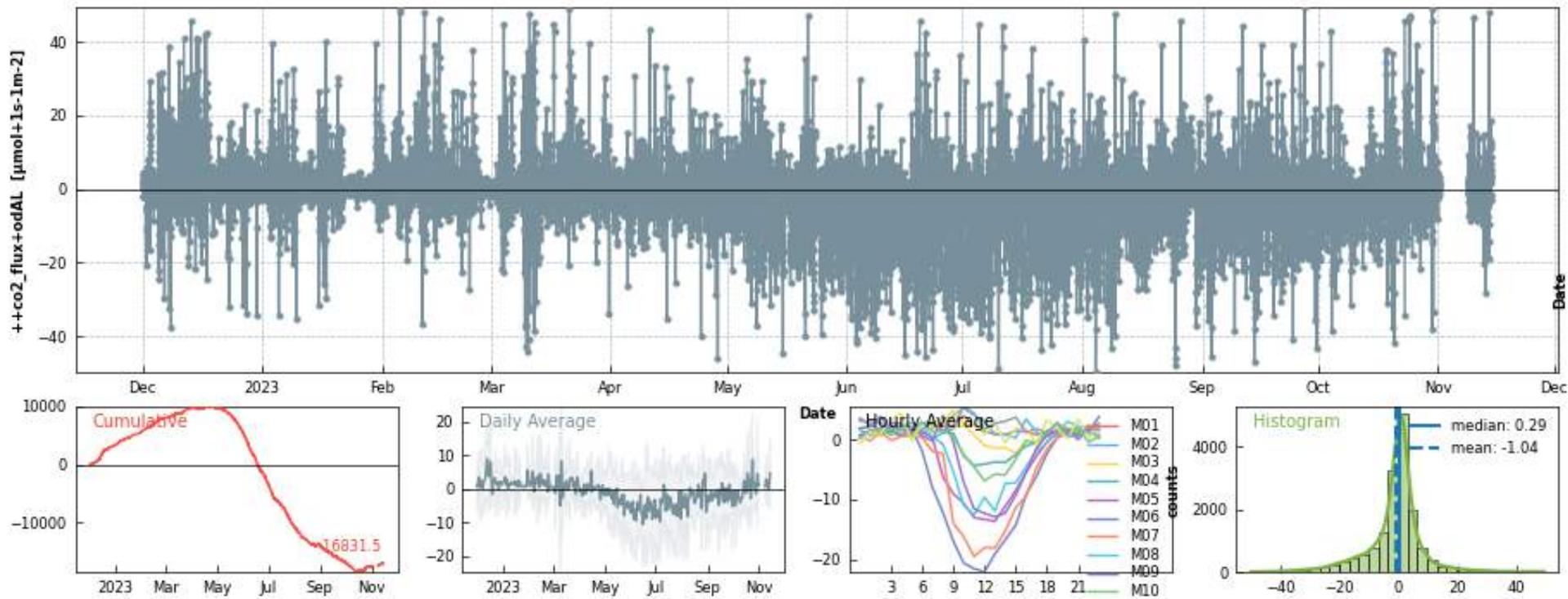
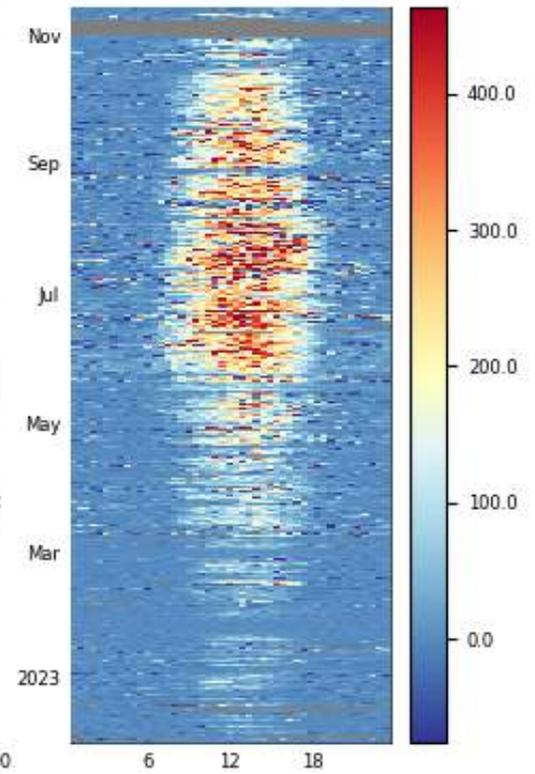
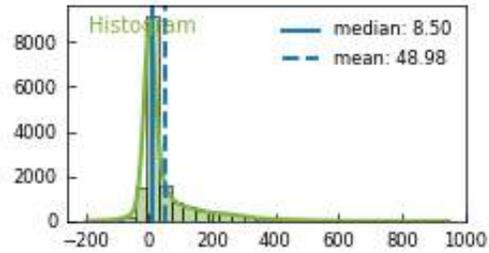
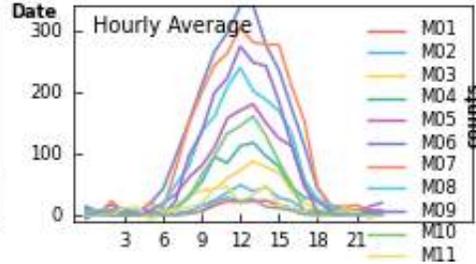
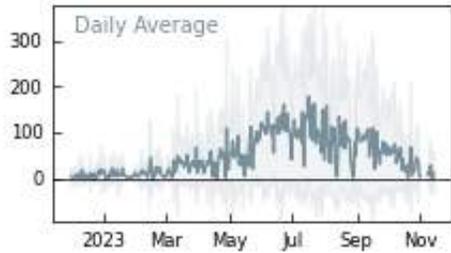
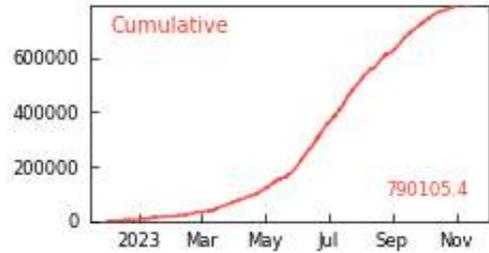
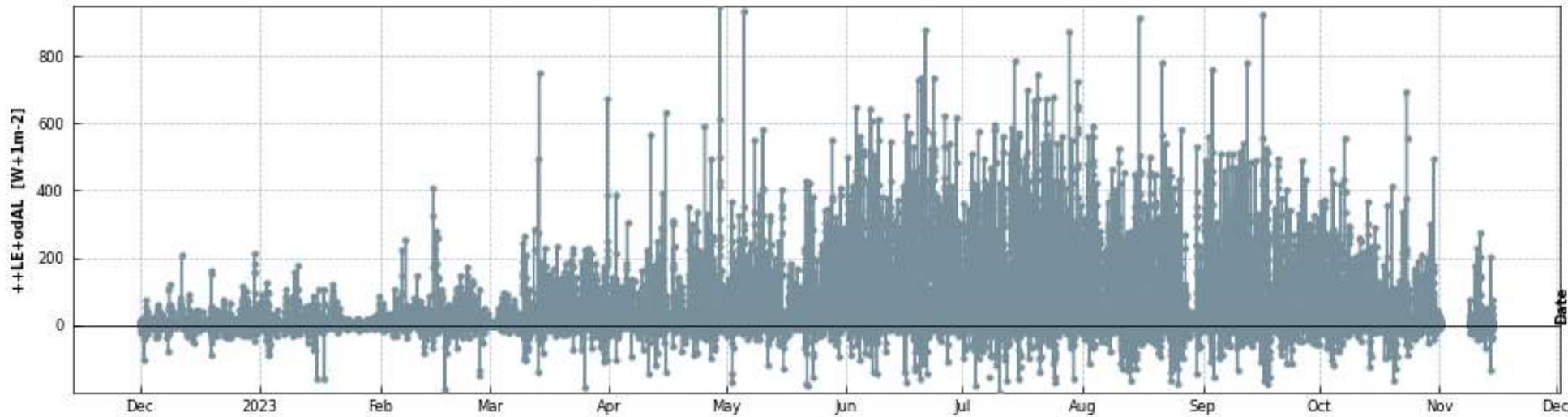




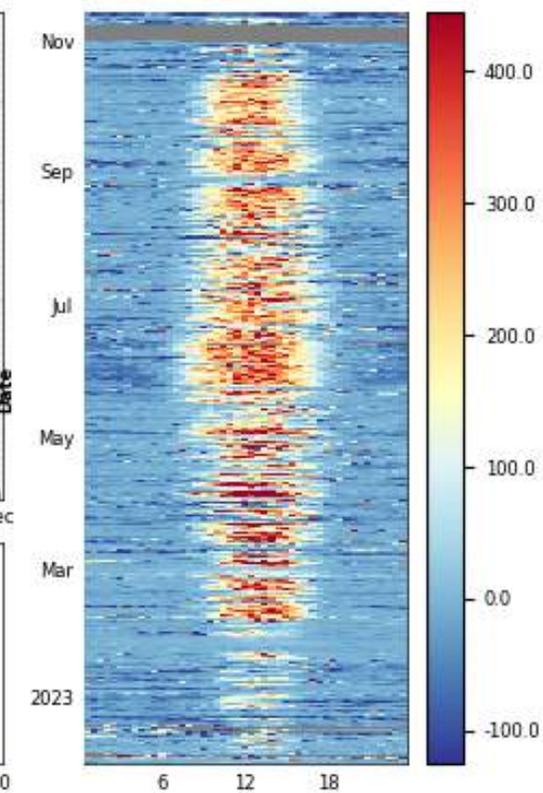
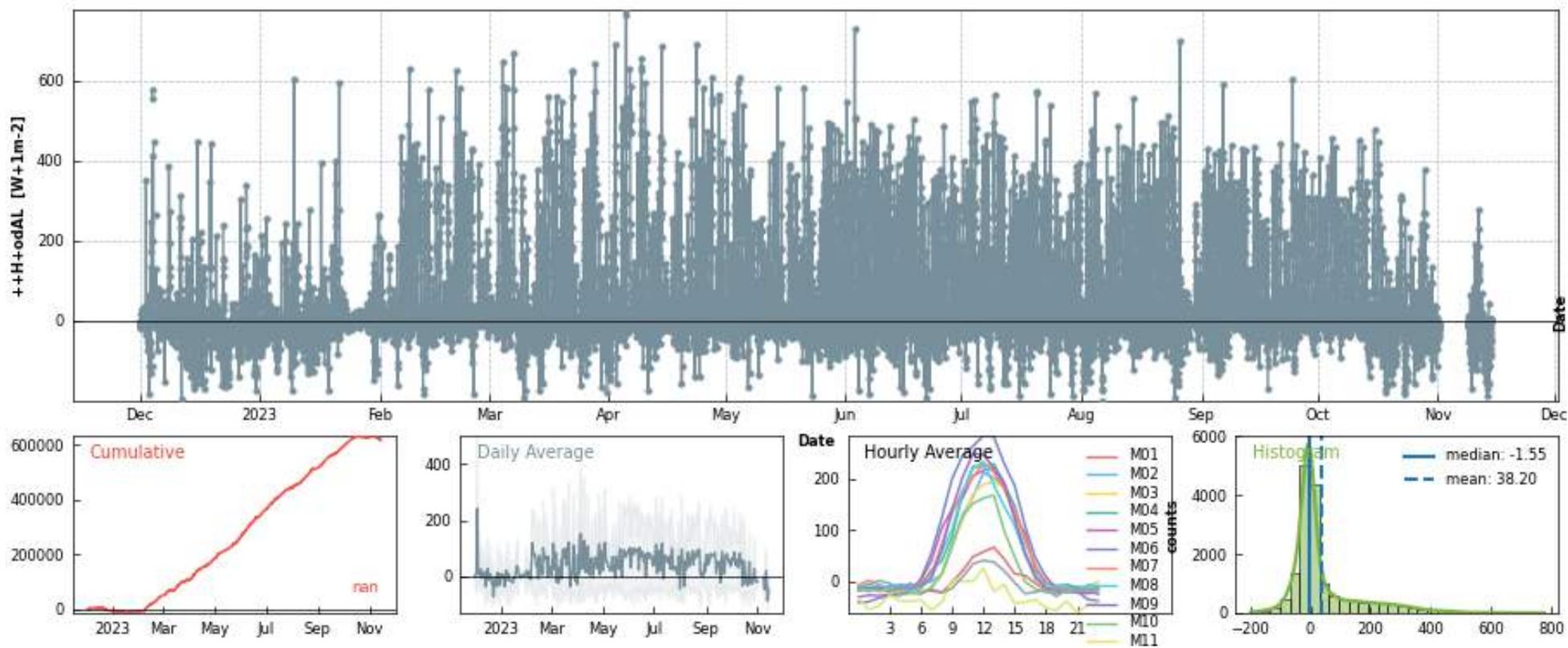
Photo: Markus Staudinger







Highest sensible heat flux in Swiss FluxNet



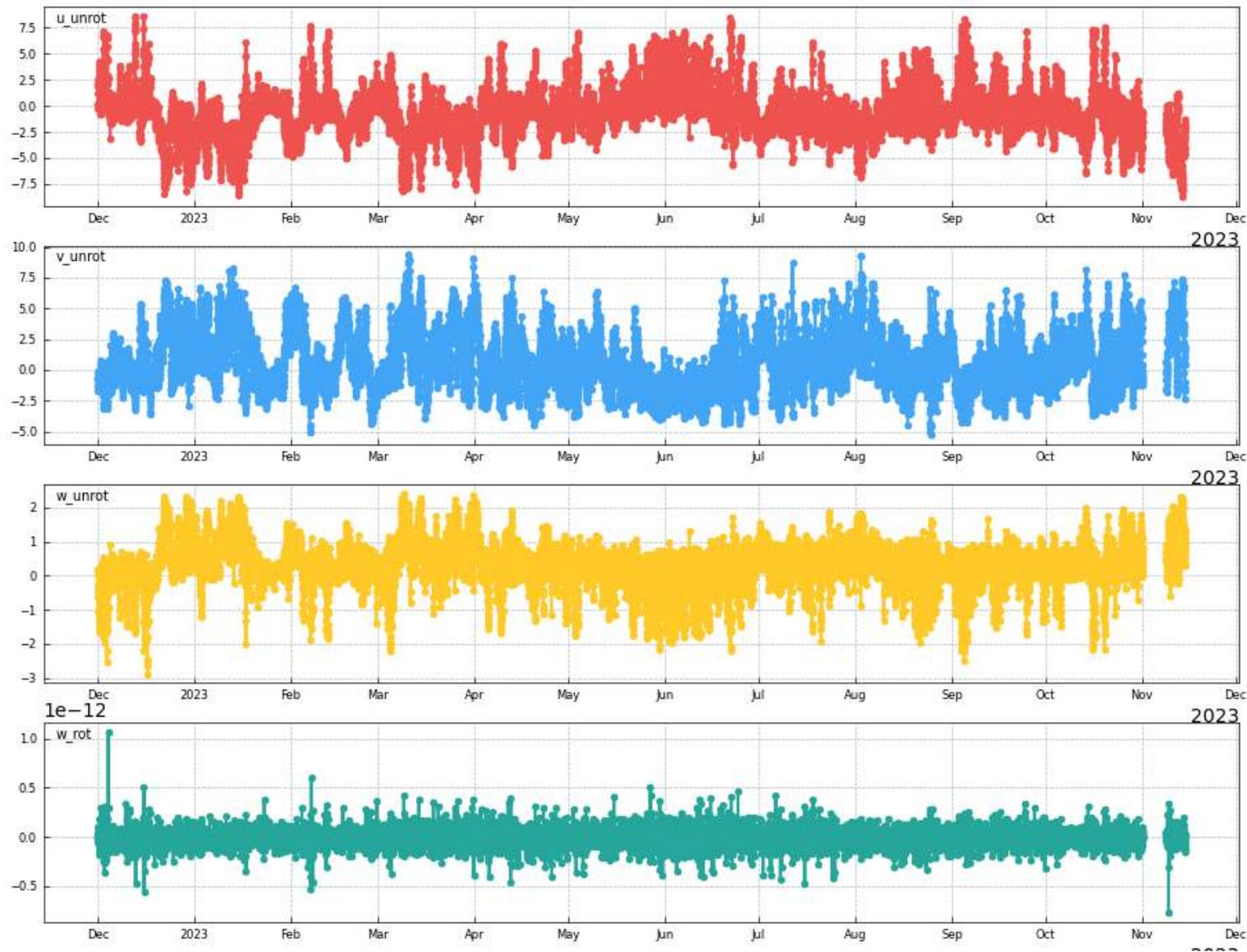
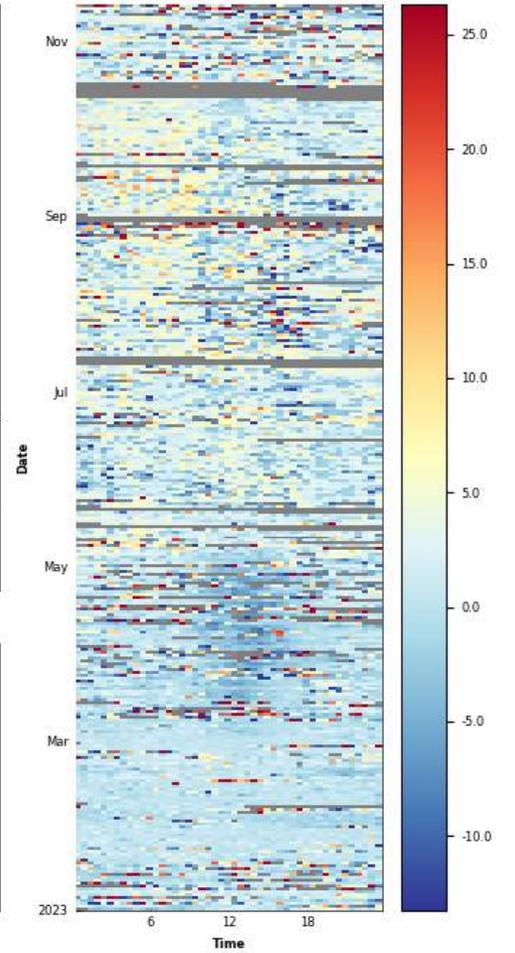
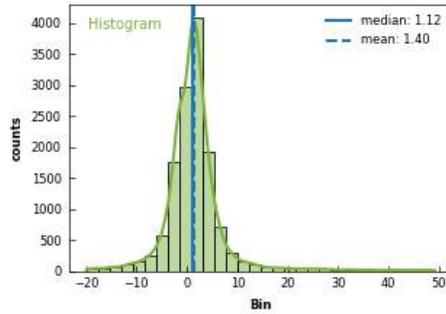
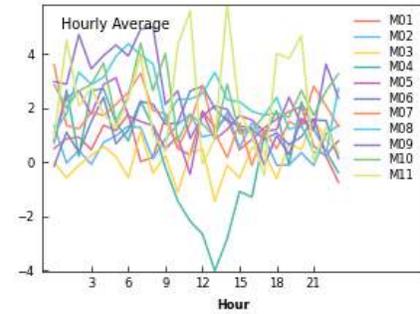
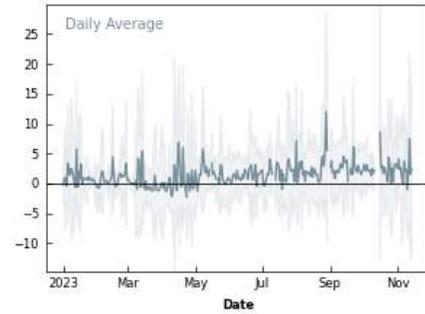
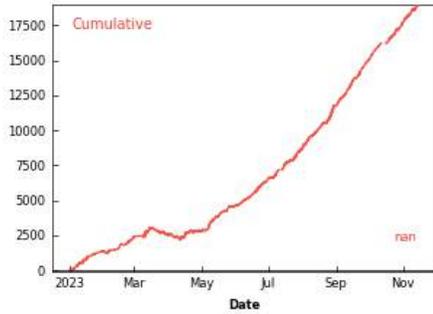
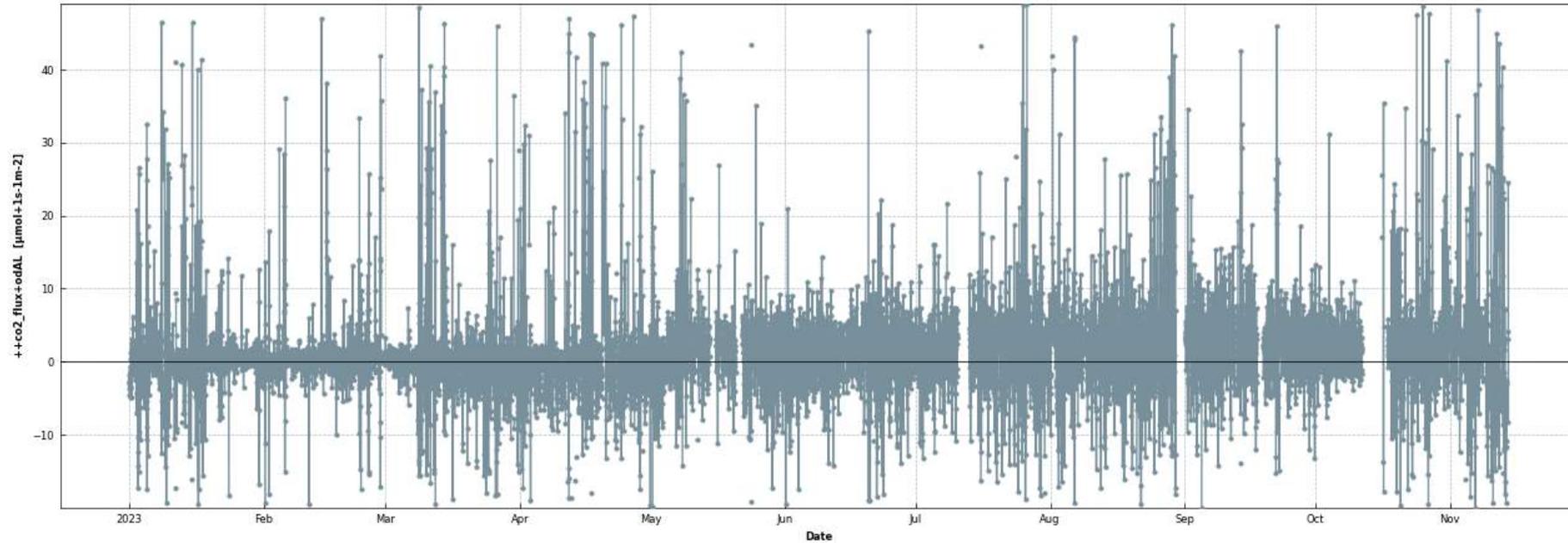
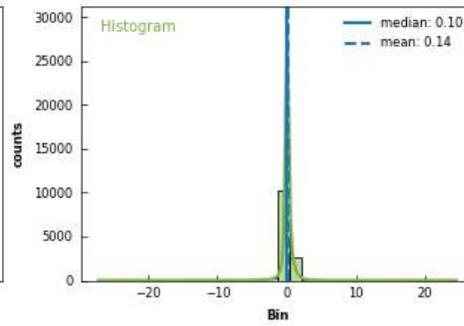
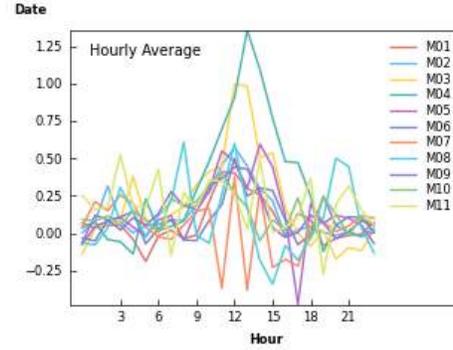
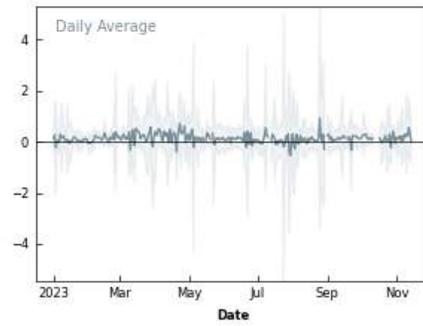
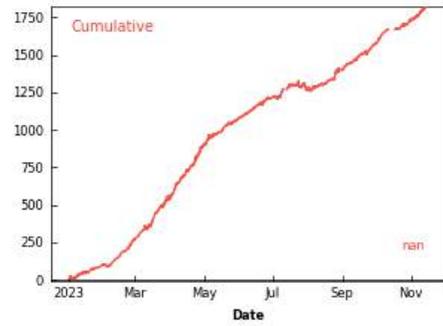
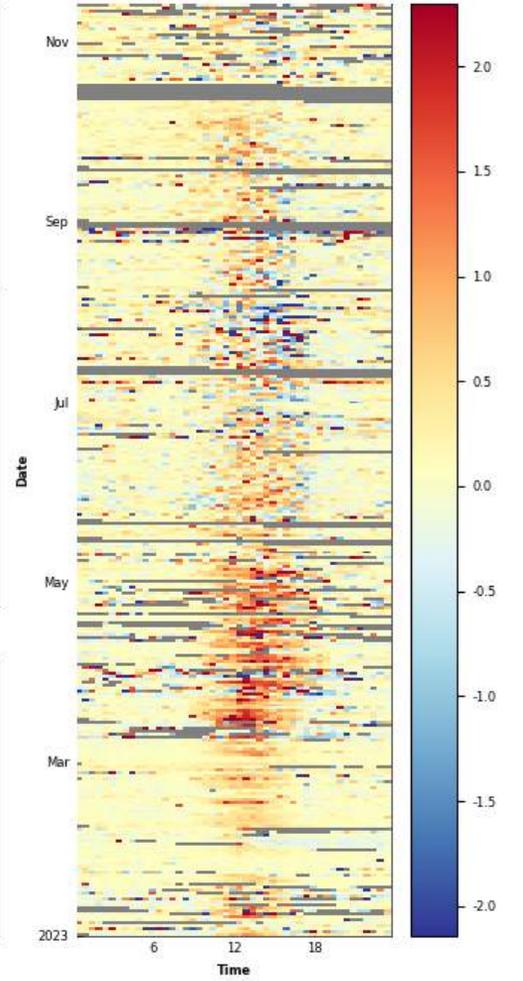
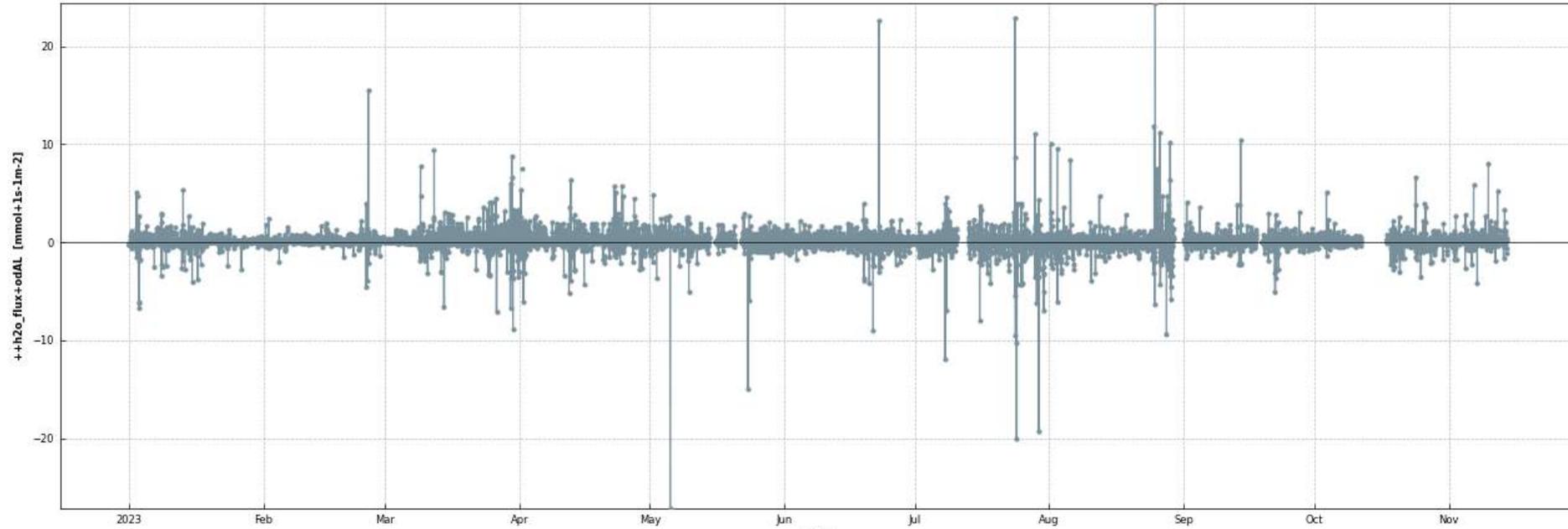
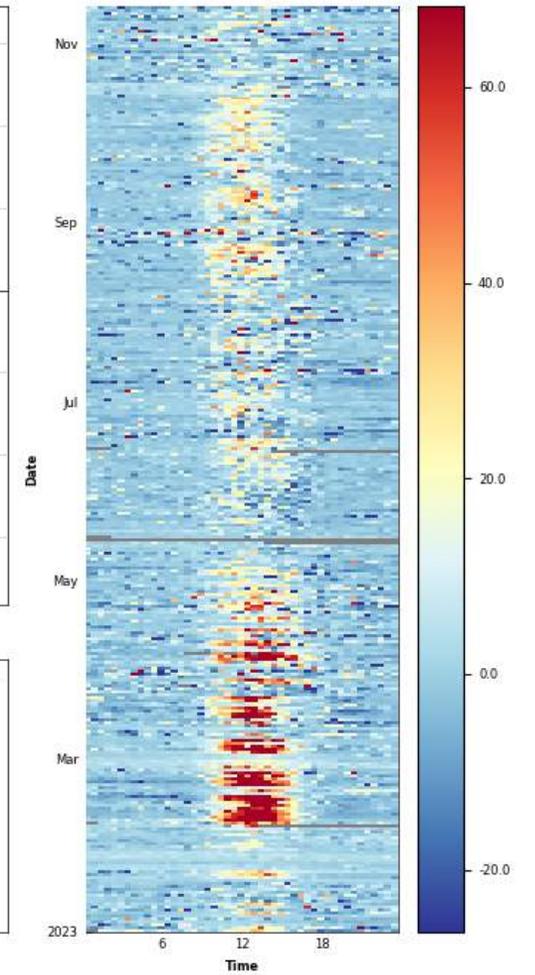
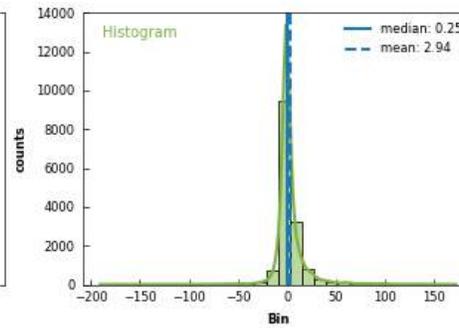
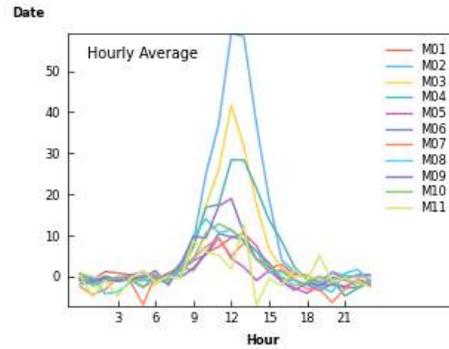
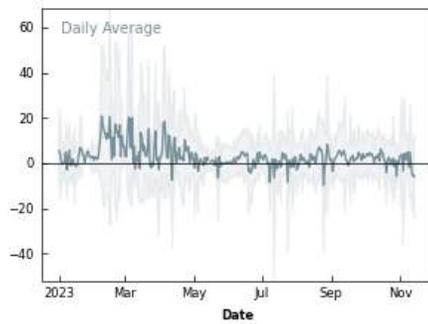
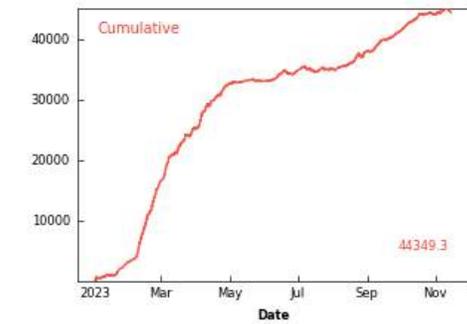
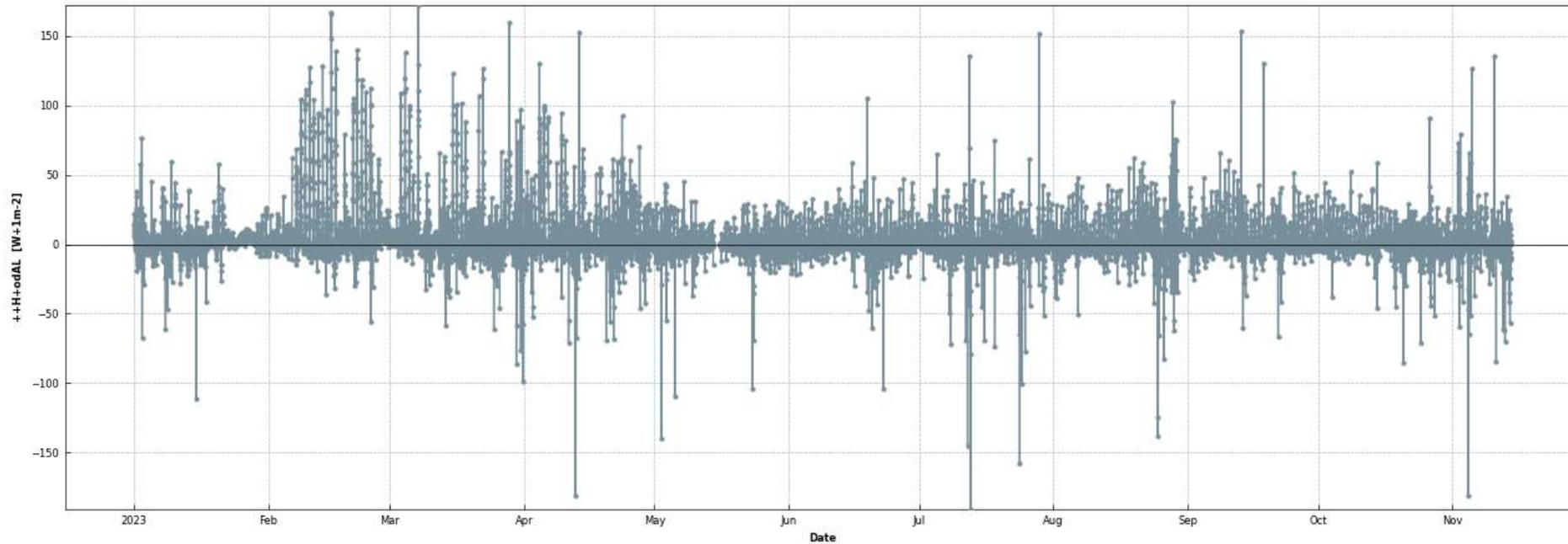




Photo: ETH GL Group







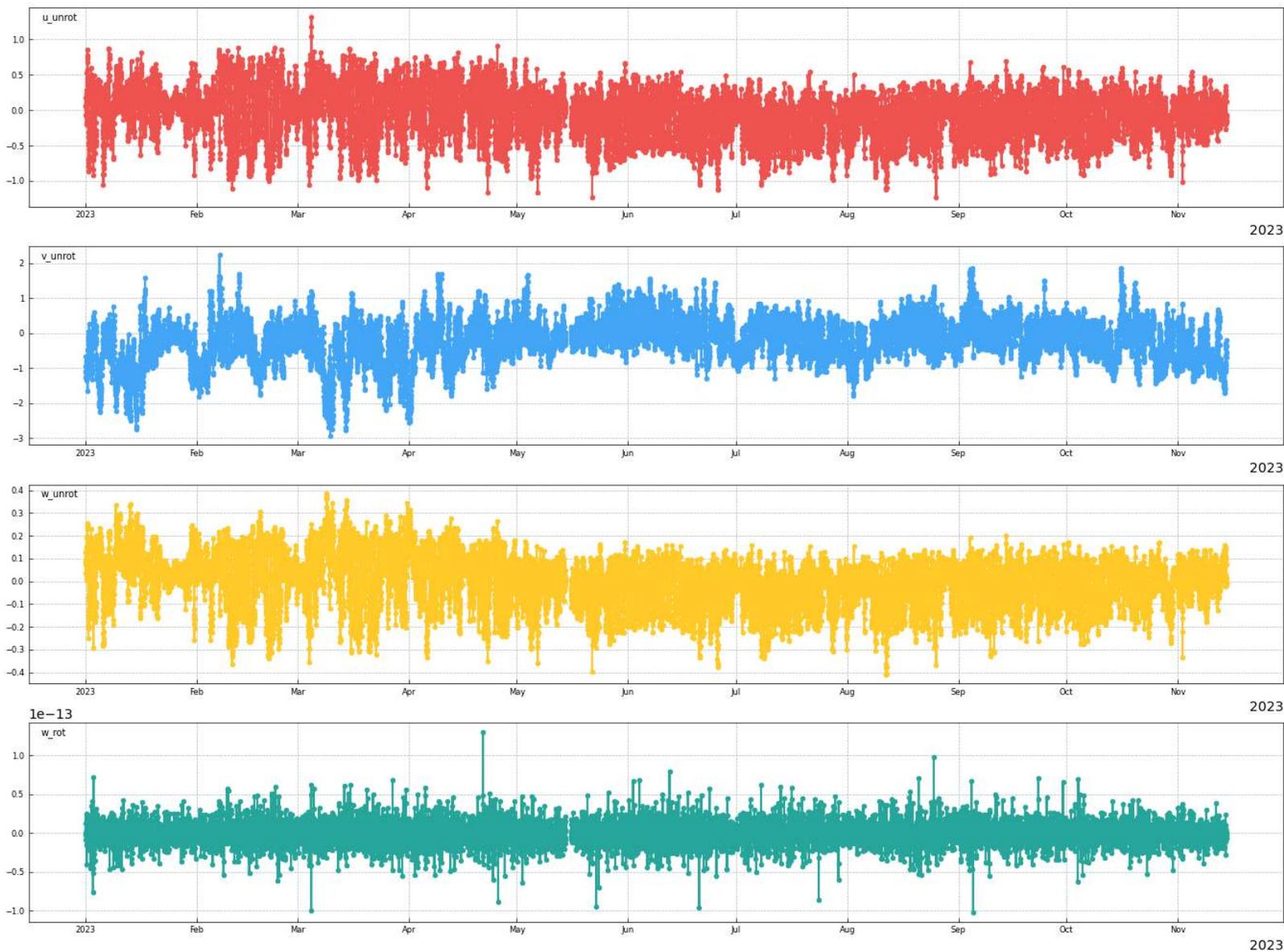
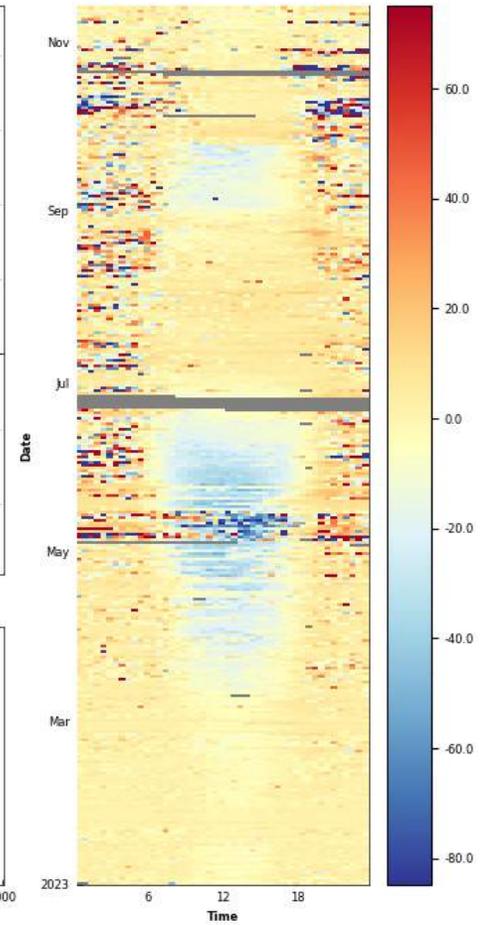
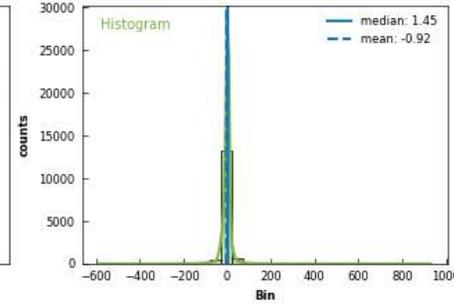
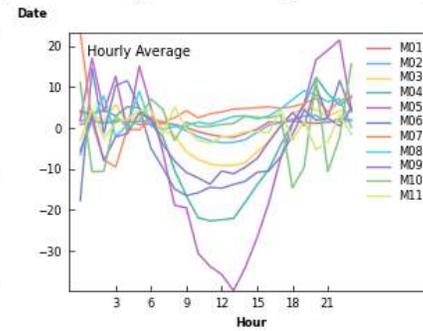
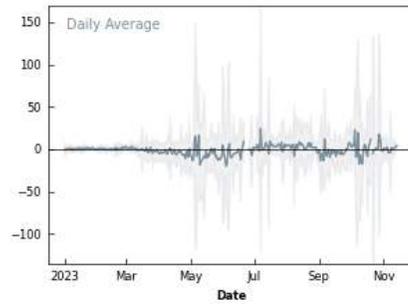
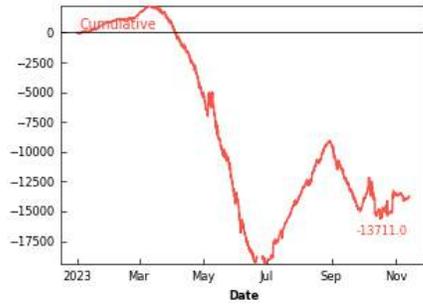
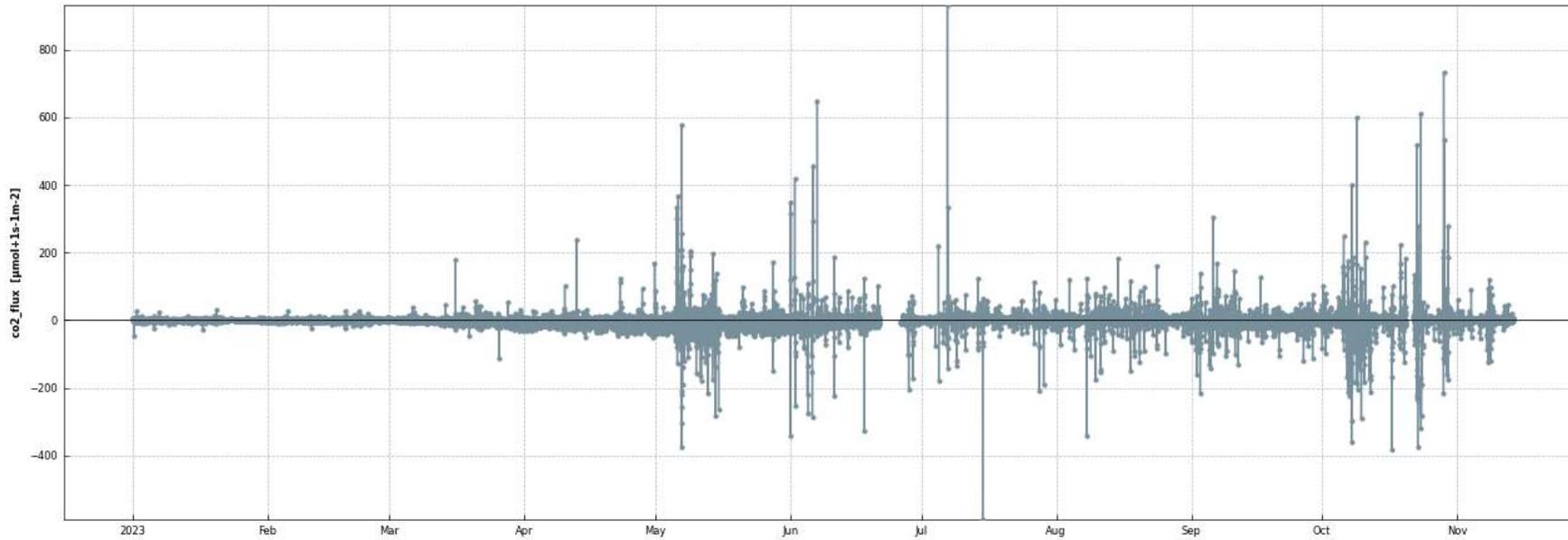
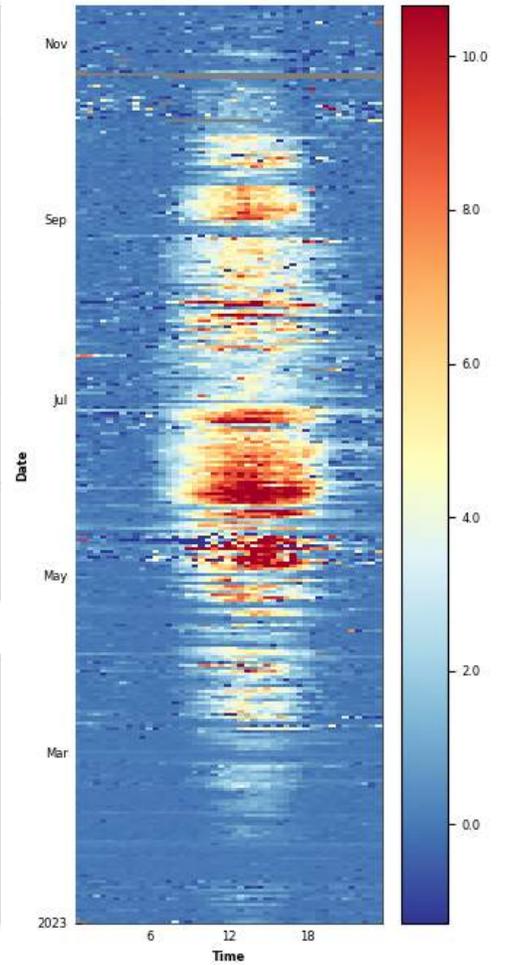
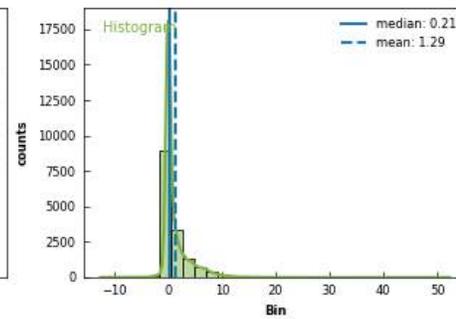
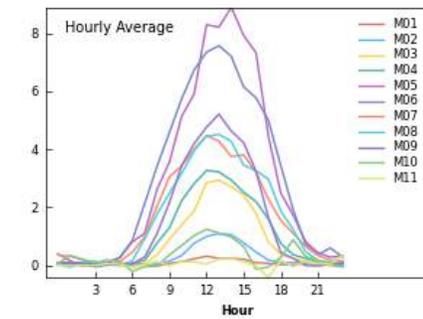
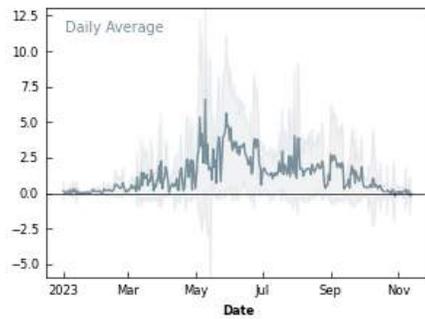
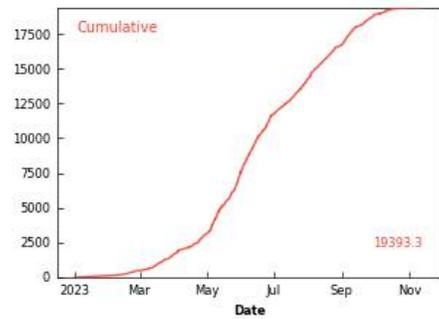
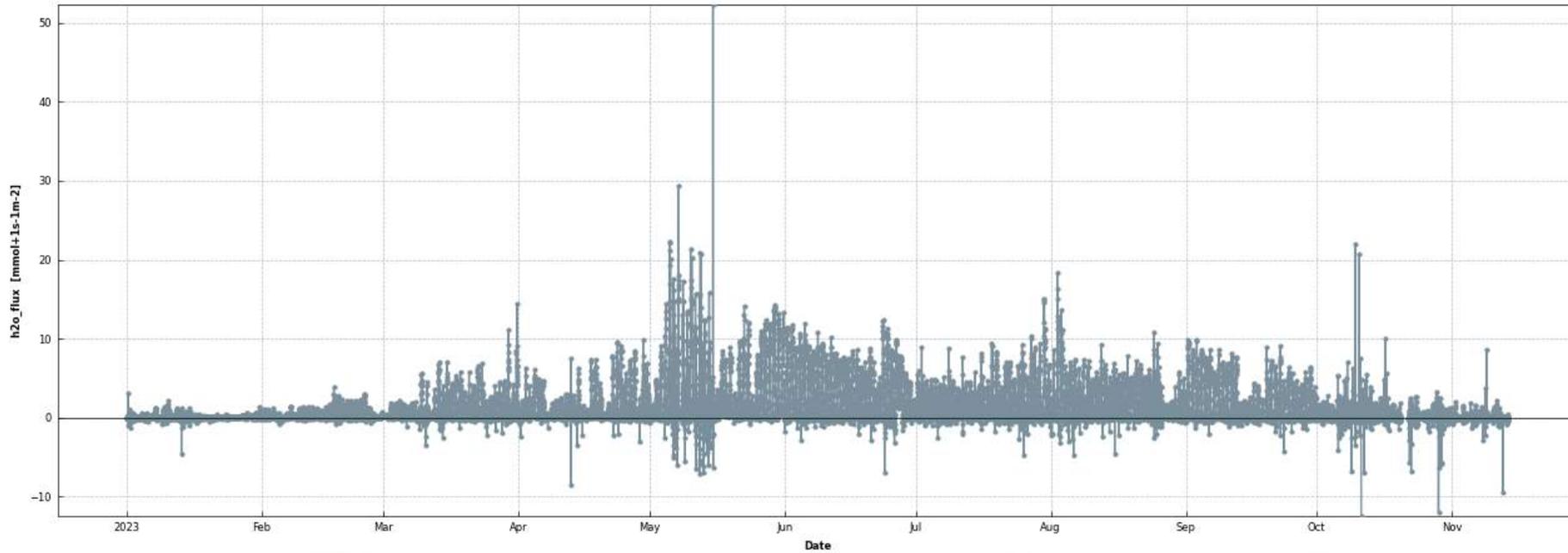




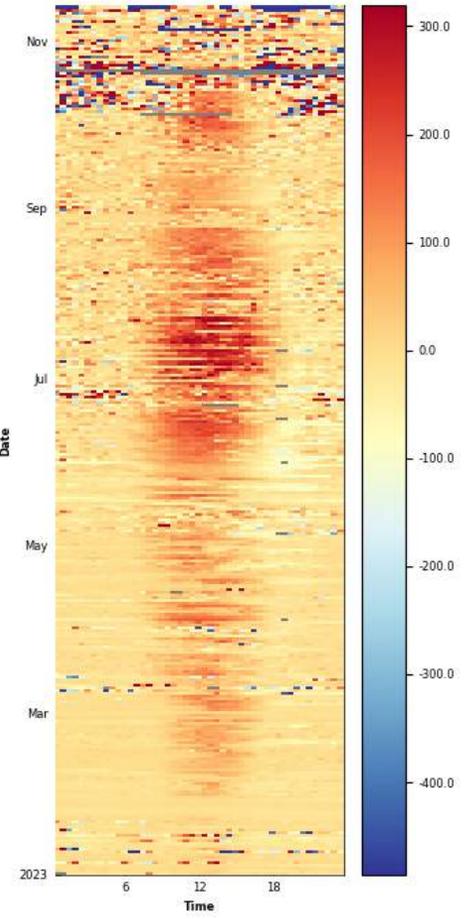
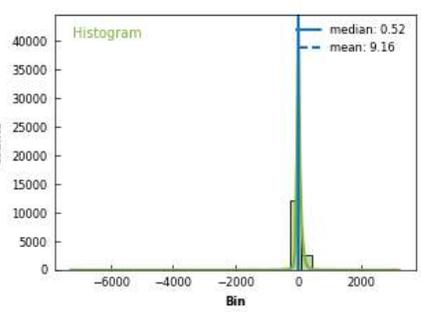
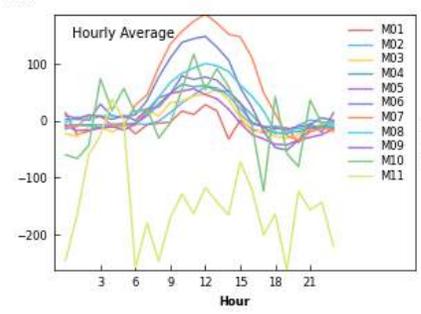
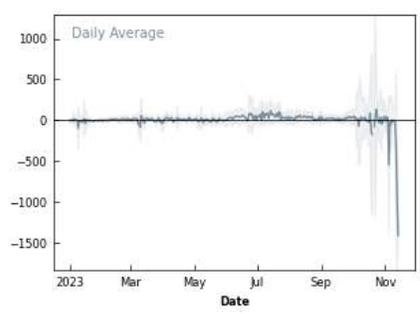
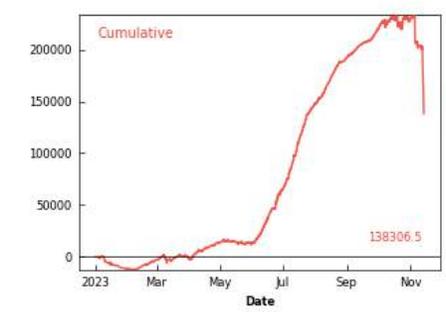
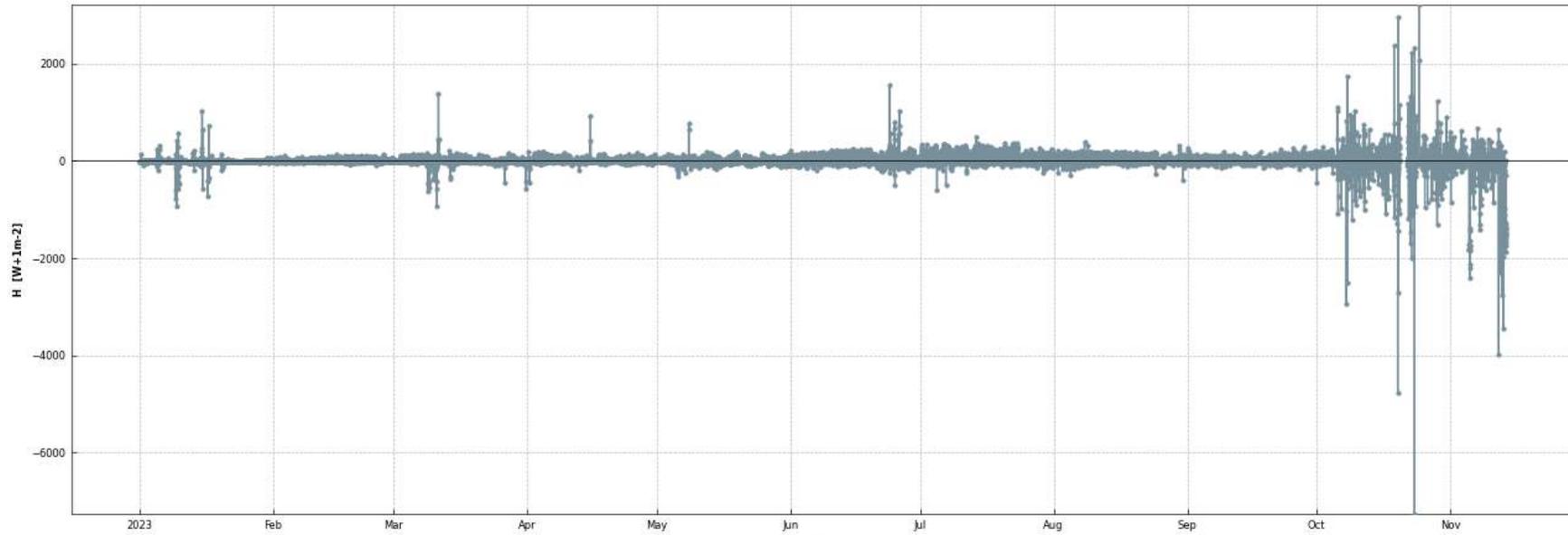
Photo: Regine Maier

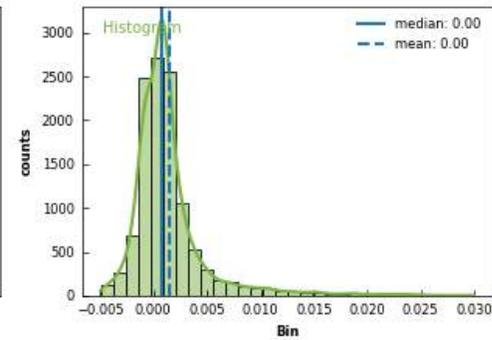
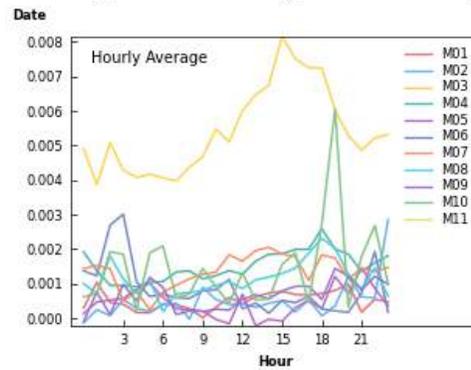
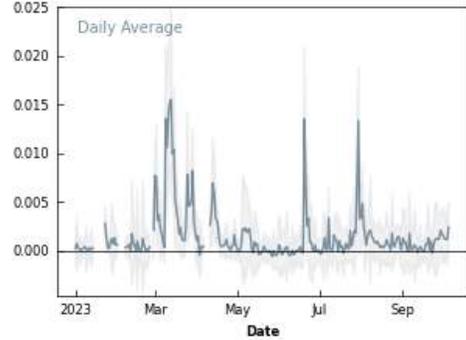
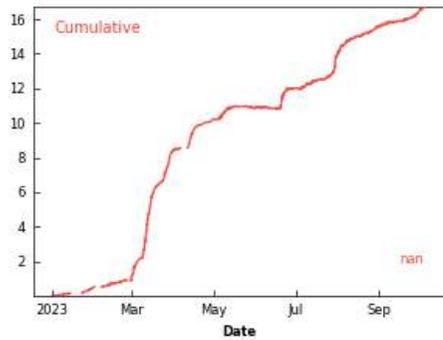
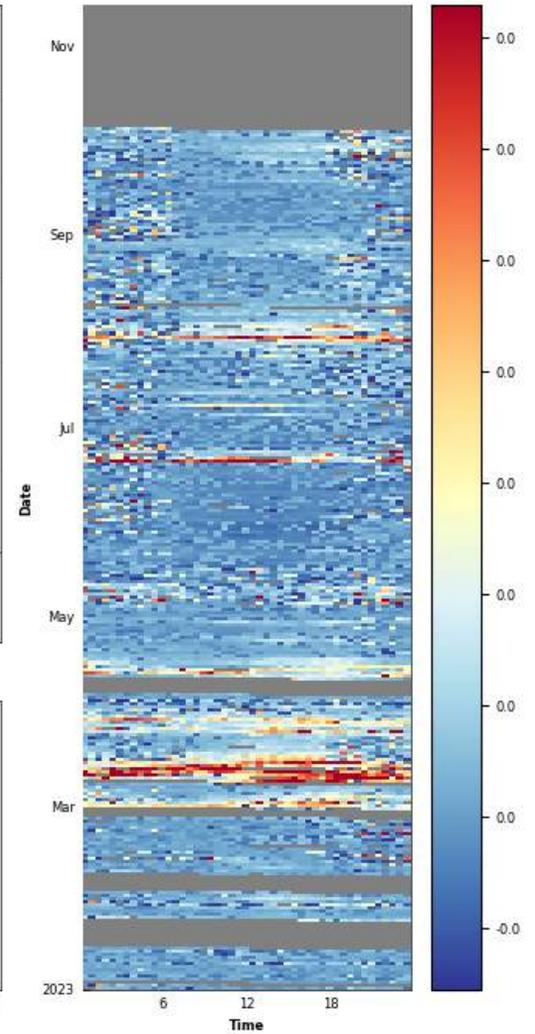
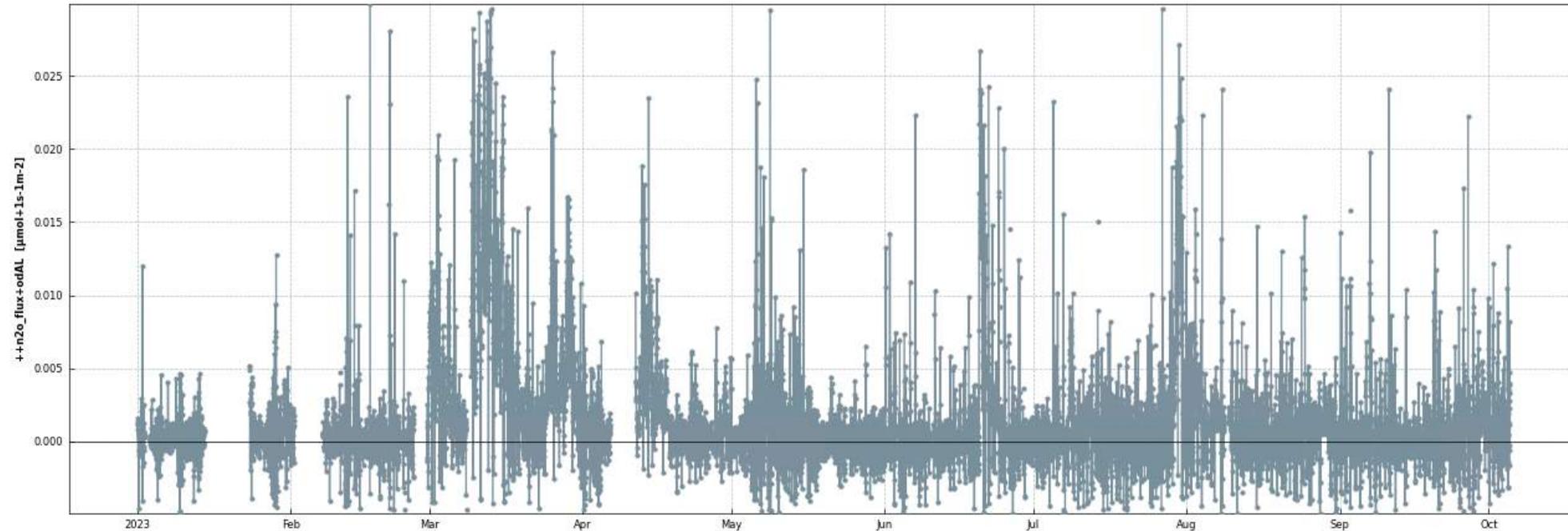


- 15 July wheat harvest
- 18 July soil cultivation
- 28 July sowing of cover crop (mixture)
- 25 September mulching of the cover crop
- 4 October sowing of winter barley

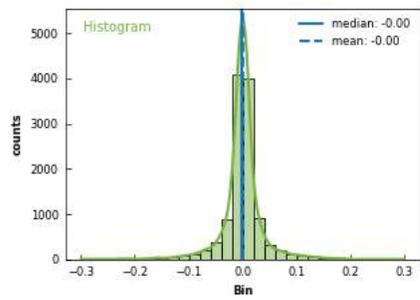
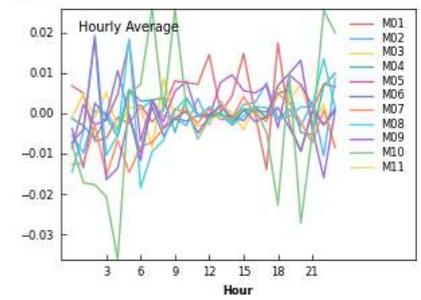
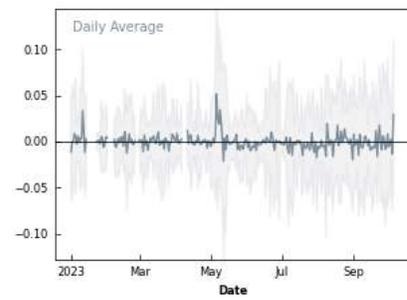
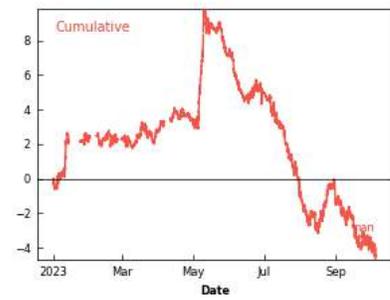
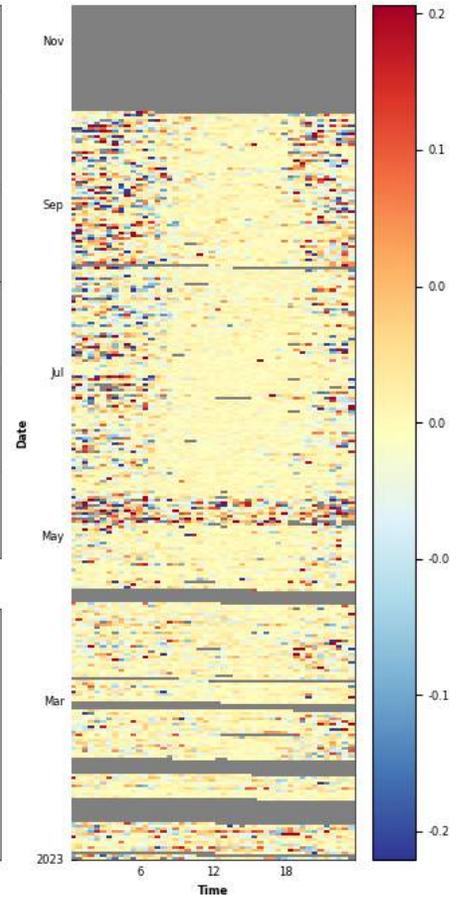
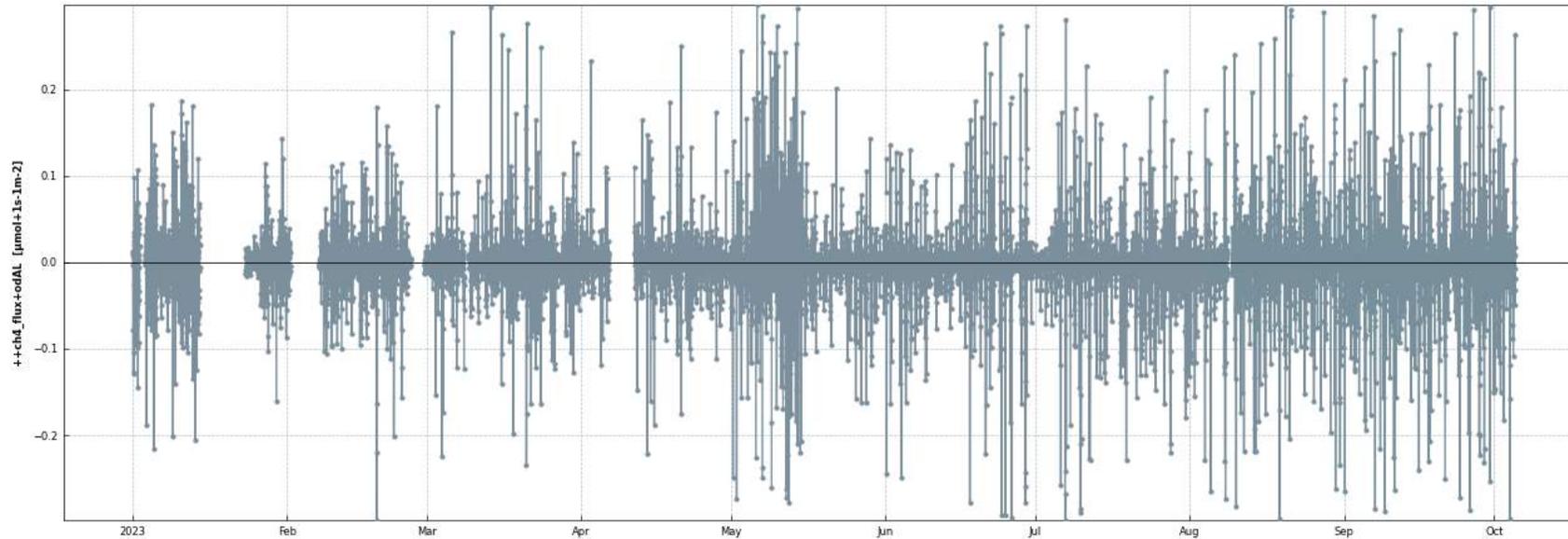


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Absolute limits: -0.005 $+0.03$



Absolute limits: $-0.3 +0.3$

