

SARGE Real Time Data Visualization Code

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Sys.Date()

#This code utilizes example data from Wilson et al., (in prep) that was collected at the COMPASS synoptic and CB-NERR site, The Goodwin Islands in Yorktown Virginia, USA.

Would be nice to have a table that is output that has the logger power in and out

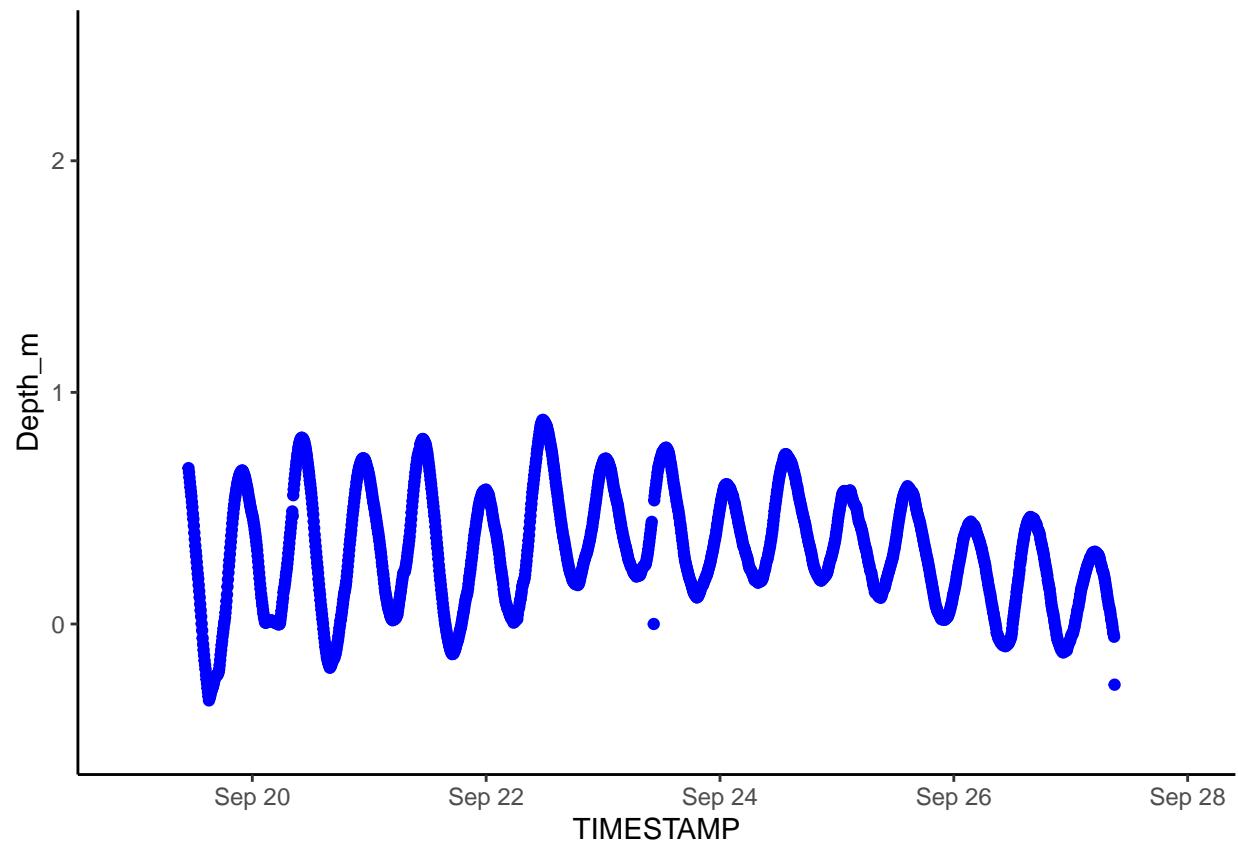
#then to plot those data to look for battery level loss.

EXO2 Sonde (Xylem Analytics) Current Data

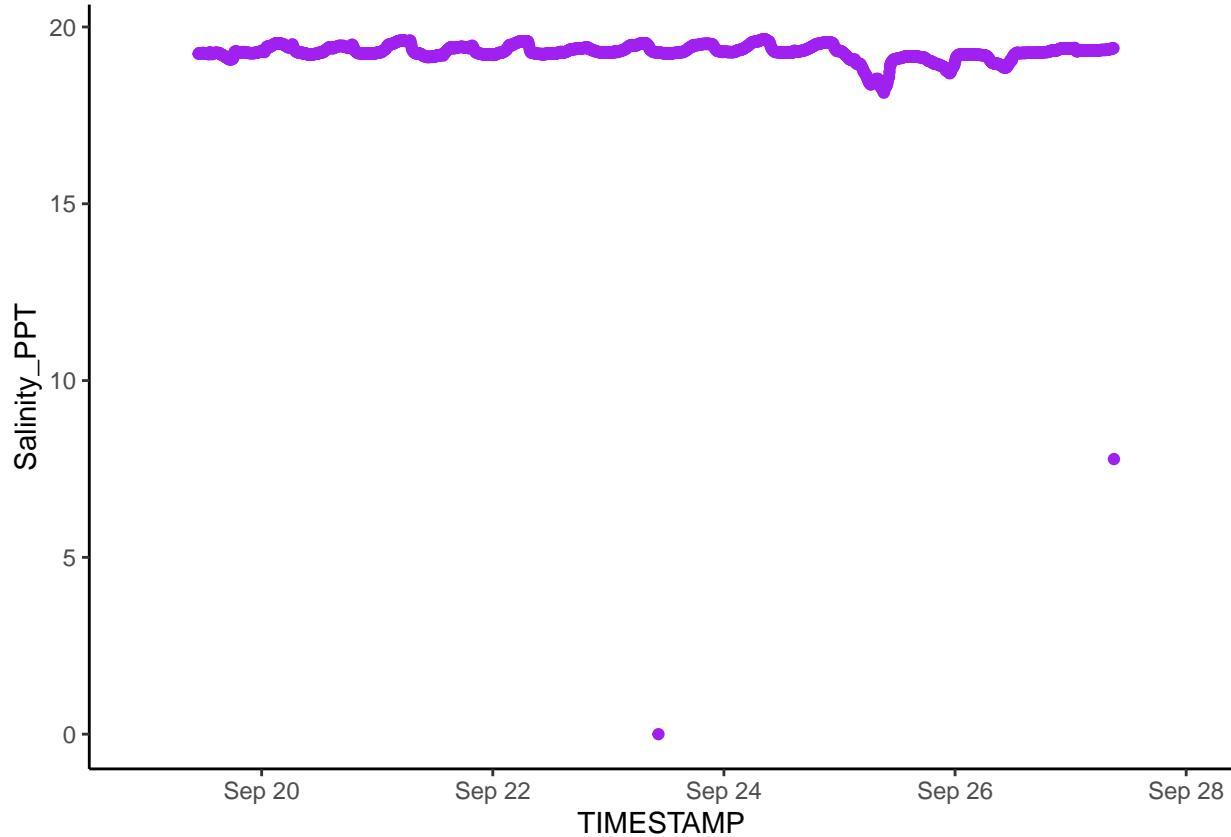
```
##          X X.1   Smp   Smp.1   Smp.2   Smp.3   Smp.4   Smp.5   Smp.6   Smp.7
## 1 2024-08-15 17:24:00    9 81524 172105      0      0 3.538 51.61 17.24  3.25
## 2 2024-08-15 17:30:00   10 81524 172705      0      0 3.507 53.09 17.77  3.22
## 3 2024-08-15 17:36:00   11 81524 173305      0      0 3.490 53.50 17.91  3.21
## 4 2024-08-15 17:42:00   12 81524 173905      0      0 3.459 53.78 18.01  3.19
## 5 2024-08-15 17:48:00   13 81524 174505      0      0 3.445 54.81 18.38  3.17
## 6 2024-08-15 17:54:00   14 81524 175105      0      0 3.432 52.20 17.45  3.17
##     Smp.8   Smp.9   Smp.10  Smp.11  Smp.12  Smp.13  Smp.14  Smp.15  Smp.16  Smp.17  Smp.18
## 1 109.40 109.54    8.31      0    1.70   3.277      0      0 2130.01 59.15  1.14
## 2 108.50 108.65    8.25      0    1.69   3.251      0      0 2113.06 57.22  1.14
## 3 107.94 108.09    8.22      0    1.68   3.238      0      0 2104.98 57.77  1.15
## 4 107.39 107.53    8.18      0    1.67   3.213      0      0 2088.38 53.45  1.15
## 5 106.88 107.02    8.15      0    1.66   3.201      0      0 2080.84 47.23  1.15
## 6 106.18 106.32    8.10      0    1.65   3.192      0      0 2074.64 66.04  1.15
##     Smp.19  Smp.20  Smp.21  Smp.22  Smp.23  Smp.24  Smp.25                               Smp.26
## 1    7.39 -38.71 29.184   0.413    6.36   11.46  29.71  # sn 21H101647 #
## 2    7.38 -38.12 29.121   0.435    6.35   11.44  29.71  # sn 21H101647 #
## 3    7.38 -37.76 29.076   0.456    6.35   11.44  33.63  # sn 21H101647 #
## 4    7.37 -37.40 29.019   0.480    6.35   11.44  33.63  # sn 21H101647 #
## 5    7.36 -36.67 28.984   0.501    6.36   11.44  29.39  # sn 21H101647 #
## 6    7.35 -36.45 28.938   0.521    6.36   11.44  29.39  # sn 21H101647 #
##                                         Smp.27
## 1    # ssn 21H105238 24A104985 23H103828 21F100689 22M100504 21J104317 21E103
## 2    # ssn 21H105238 24A104985 23H103828 21F100689 22M100504 21J104317 21E103
## 3    # ssn 21H105238 24A104985 23H103828 21F100689 22M100504 21J104317 21E103
## 4    # ssn 21H105238 24A104985 23H103828 21F100689 22M100504 21J104317 21E103
## 5    # ssn 21H105238 24A104985 23H103828 21F100689 22M100504 21J104317 21E103
## 6    # ssn 21H105238 24A104985 23H103828 21F100689 22M100504 21J104317 21E103

## Warning: Removed 1795 rows containing missing values or values outside the scale range
```

```
## (`geom_point()`).
```



```
## Warning: Removed 1795 rows containing missing values or values outside the scale range
## (`geom_point()`).
```



SontekIQ series (Xylem Analytics) Current Data

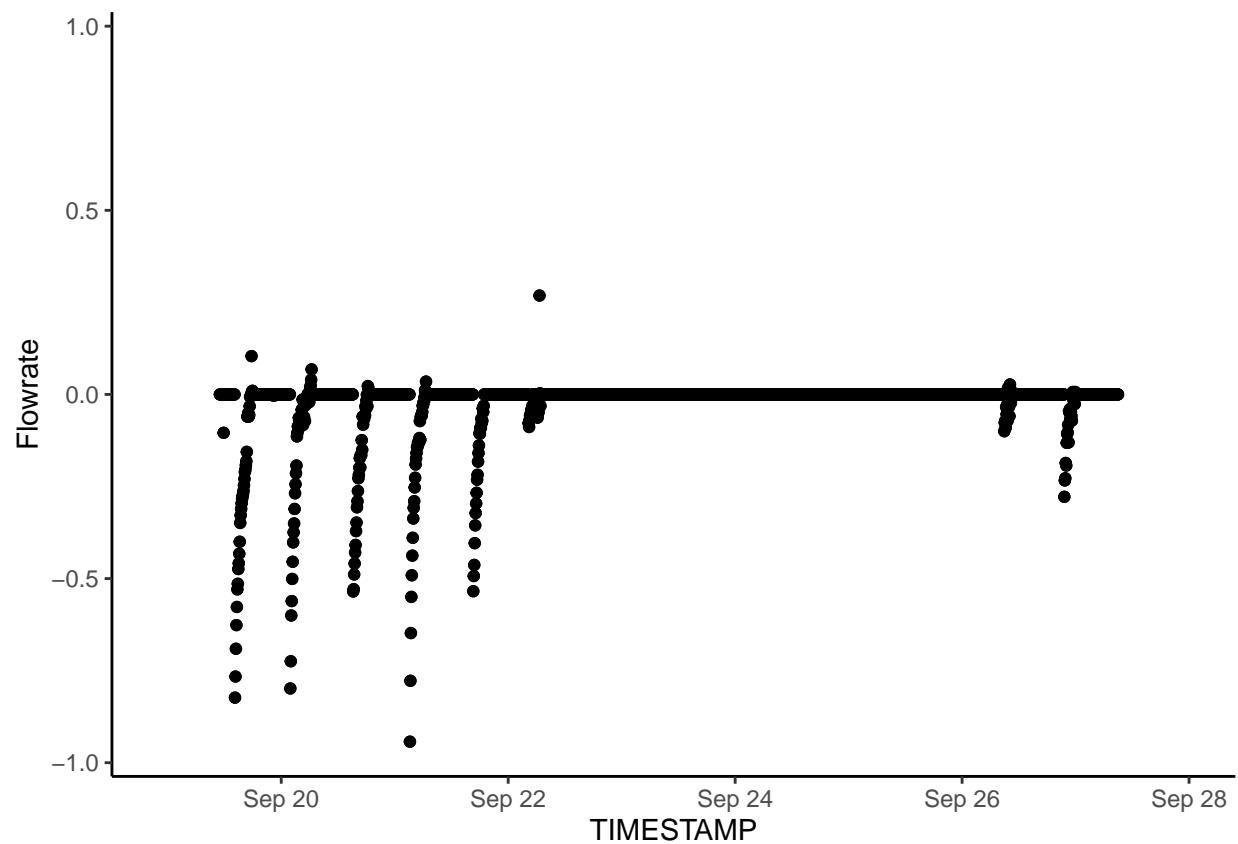
```

## Warning: `as.tibble()` was deprecated in tibble 2.0.0.
## i Please use `as_tibble()` instead.
## i The signature and semantics have changed, see `?as_tibble`.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

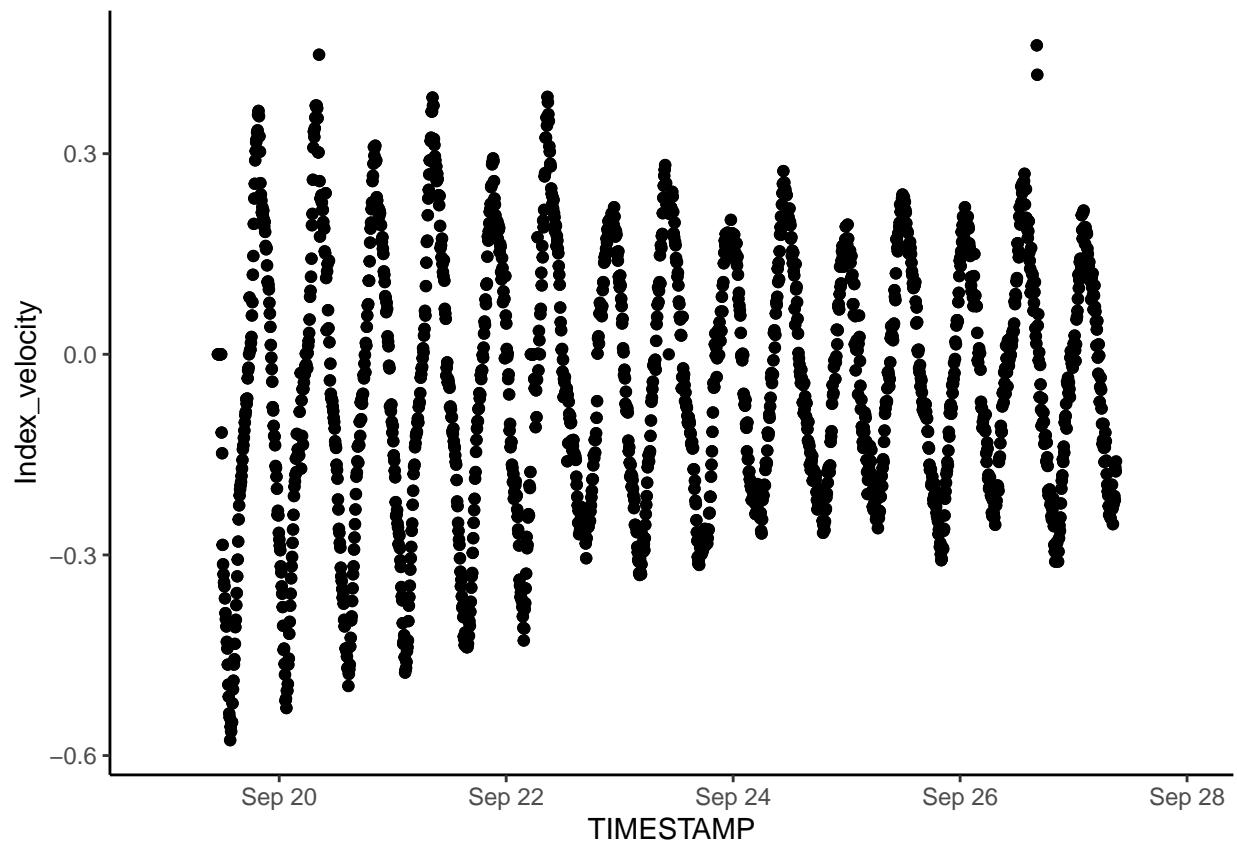
## # A tibble: 6 x 28
##   TIMESTAMP RECORD SONTEK_ID Sample_number yyyy MM dd hh Minute ss
##   <chr>     <chr>    <chr>      <chr>      <chr> <chr> <chr> <chr> <chr> <chr>
## 1 2024-08-1~ 1715     ""        1697       2024  7   16   16   42   0
## 2 2024-08-1~ 1716     ""        1698       2024  7   16   16   48   0
## 3 2024-08-1~ 1717     ""        1698       2024  7   16   16   48   0
## 4 2024-08-1~ 1718     ""        1699       2024  7   16   16   54   0
## 5 2024-08-1~ 1719     ""        1699       2024  7   16   16   54   0
## 6 2024-08-1~ 1720     ""        1700       2024  7   16   17   0    0
## # i 18 more variables: Flowrate <chr>, Stage <chr>, Mean_velocity <chr>,
## # Total_volume <chr>, Water_depth <chr>, Index_velocity <chr>,
## # Cross_area <chr>, Water_temperature <chr>, System_status <chr>,
## # Velocity_XZxc <chr>, Velocity_XZzc <chr>, Velocity_XZxL <chr>,
## # Velocity_XZxR <chr>, Batt_Vol_Sontek <chr>, Pitch_angle <chr>,
## # Roll_angle <chr>, Perc_submergence <chr>, IceScore <chr>

```

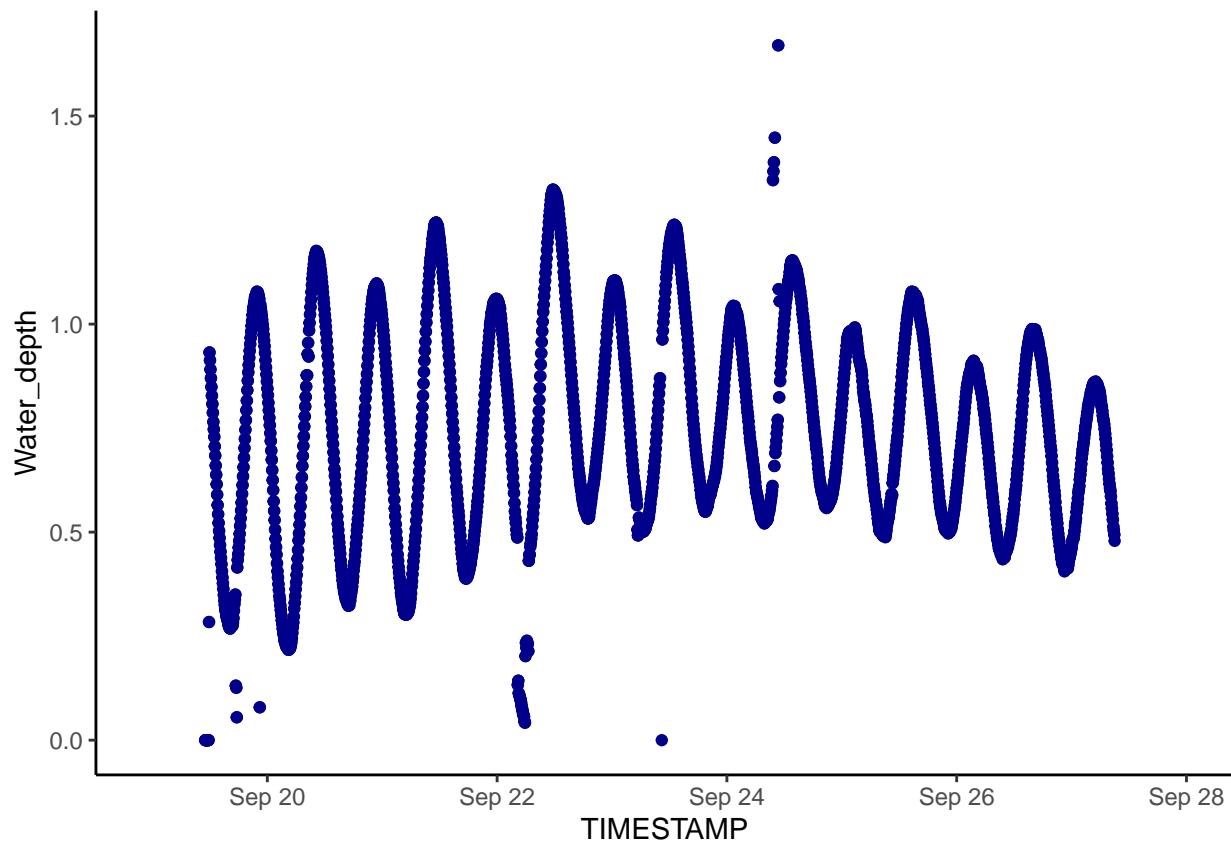
```
## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
```



```
## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
```



```
## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
```



LI7810 CH₄/CO₂/H₂O Trace Gas Analyzer (LI-COR) Current Data

```

##          TIMESTAMP RECORD      TimeLong7810 LI7810_time      Seconds
## 3 2024-08-15 17:19:20    347 2024-08-15 12:21:37 1723746097 1.723746E+09
## 4 2024-08-15 17:19:30    348 2024-08-15 12:21:47 1723746107 1.723746E+09
## 5 2024-08-15 17:19:40    349 2024-08-15 12:21:57 1723746117 1.723746E+09
## 6 2024-08-15 17:19:50    350 2024-08-15 12:22:07 1723746127 1.723746E+09
## 7 2024-08-15 17:20:00    351 2024-08-15 12:22:17 1723746137 1.723746E+09
## 8 2024-08-15 17:20:10    352 2024-08-15 12:22:27 1723746147 1.723746E+09
##   Nanoseconds    NDX Diag      H2O      CO2      CH4 cavity_p cavity_t
## 3 7.928979E+08 13341     0 19678.57 404.0764 2512.945 40.0914 55.001
## 4 7.922249E+08 13381     0 20177.33 434.8777 2479.474 40.0972 55.001
## 5 7.91894E+08 13421      0 19744.65 441.2002 2432.196 40.0935 55.001
## 6 7.915549E+08 13461     0 10452.85 3263.342 2694.39 40.0352 55.001
## 7 7.908881E+08 13501     0 9195.961 3217.906 2691.476 39.9757 55.001
## 8 7.905469E+08 13541     0 8699.335 3150.83 2688.499 39.9651 55.001
##   laser_phase_p laser_t residual ringdown thermal_enc_t phase_err
## 3        30.7261 37.7684 0.00309244 10.6615      54.5005 -122
## 4        30.724 37.7684 0.00314042 10.6601      54.5005    75.5
## 5        30.7236 37.7684 0.00304865 10.6617      54.5005 -173.75
## 6        30.8963 37.7699 0.00252448 10.6729      54.5005 -873
## 7        30.7728 37.7684 0.00164293 10.674      54.5005 -821.75
## 8        30.7211 37.7684 0.00158419 10.6747      54.5005   126.25
##   laser_t_shift      vin cavity_p_sp board_t case_t exfit_tau_rd1 peak_ht_1
## 3        0.369392 24.4199 40.1409 52.5386 14.3901      10.6615 0.98735

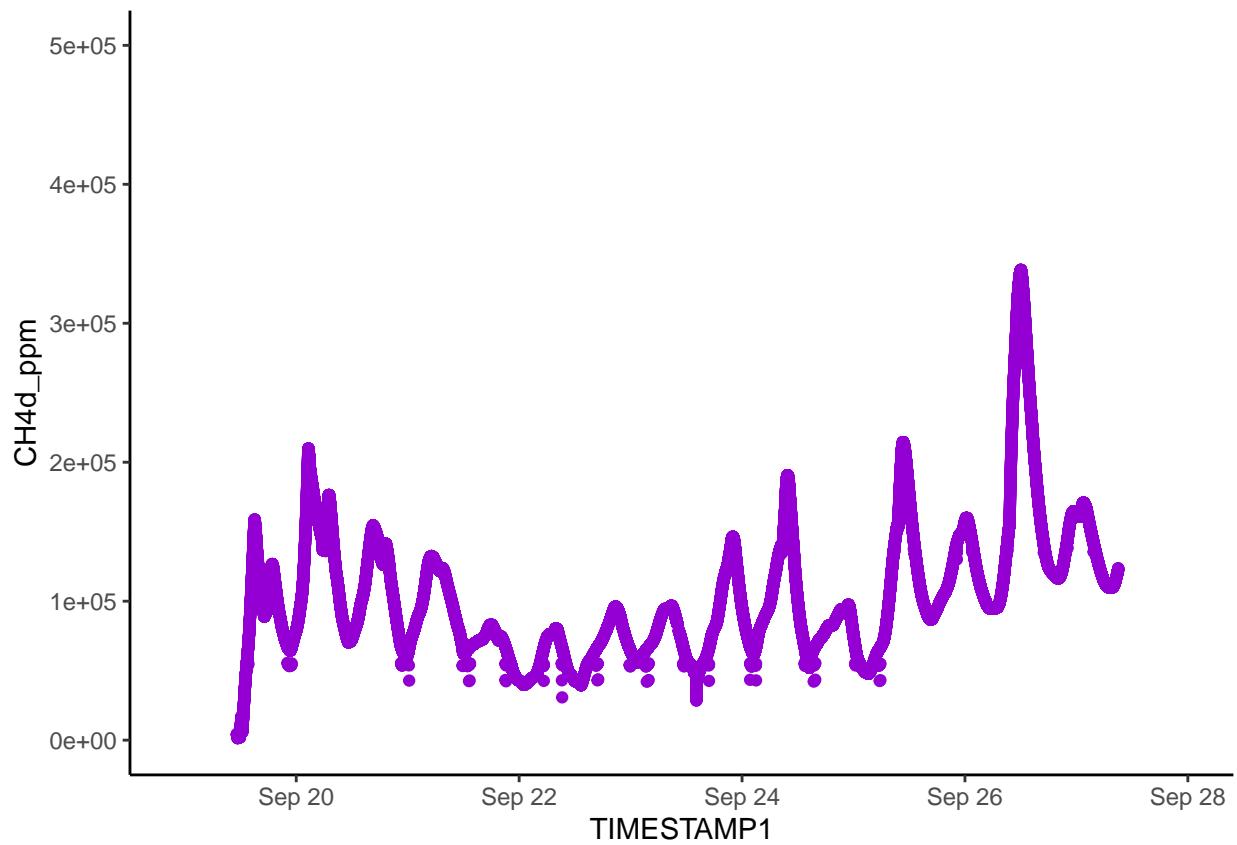
```

```

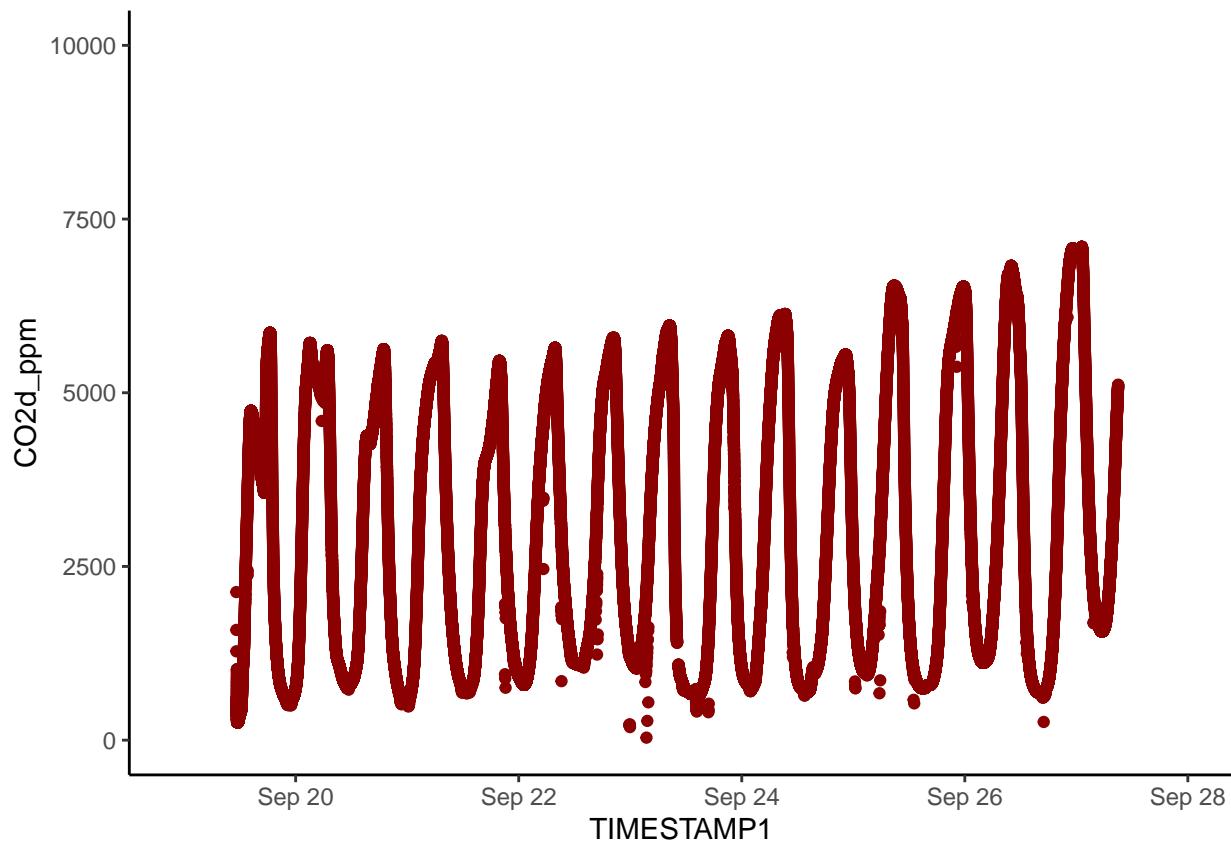
## 4      0.369392 24.4701    40.1448 52.5396 14.3901    10.6601 0.987045
## 5      0.369392 24.474     40.1435 52.5418 14.3901    10.6617 0.987304
## 6      0.370964 24.4736    40.0837 52.5407 14.3901    10.6729 0.989179
## 7      0.369392 24.4756    40.025 52.5342 14.3901    10.674 0.989513
## 8      0.369392 24.4756    40.0156 52.5364 14.3901    10.6747 0.989597
##   exfit_tau_rd2 peak_ht_2 tec_sp phase_ctrl_out meas_phase laser_phase_sp
## 3      10.6672 0.990229 37.7629    18705.8 15878 16000
## 4      10.6675 0.990175 37.7629    18705.2 16075.5 16000
## 5      10.6678 0.990192 37.7629    18705 15826.2 16000
## 6      10.6475 0.98633 37.7644    18807.8 15127 16000
## 7      10.6459 0.986173 37.7629    18732.8 15178.2 16000
## 8      10.6449 0.98608 37.7629    18704 16126.2 16000
##   num_peaks_win post_ringdwn_1_ign_len ringdwn_1_loc peak_x0 xderiv_weight
## 3          5 4703.5 81784.8 88661 8.20386E-05
## 4          5 4696.25 81818 88673.8 4.46547E-05
## 5          5 4718.5 81801.5 88676.8 4.58853E-05
## 6          5 4696.25 81721 88617 -0.00135378
## 7          5 4717.5 81747 88614.2 -0.000215856
## 8          5 4709 81809 88676.5 -1.27004E-05
##   xderiv2_weight ch4_spec_weight co2_spec_weight h2o_spec_weight start_freq
## 3      -0.00188268 1.28081 0.925073 1.94524 6048.29
## 4      -0.00188523 1.26287 1.0049 1.99363 6048.29
## 5      -0.00187956 1.23946 1.02824 1.95166 6048.29
## 6      -0.000850127 1.39012 9.16799 1.04411 6048.29
## 7      -0.000801323 1.39085 9.07027 0.920135 6048.29
## 8      -0.000739085 1.39019 8.8916 0.87105 6048.29
##   cavity_htr_w laser_ref_pwr offset_weight slope_weight evenodd_weight
## 3      0.873437 52239.2 -0.00188268 -0.0217255 -0.00580798
## 4      0.873437 52238 -0.00188523 -0.0216348 -0.00579974
## 5      0.873437 52239.5 -0.00187956 -0.0216654 -0.00578562
## 6      0.873437 52242 -0.000850127 -0.00906468 -0.00595254
## 7      0.873437 52244 -0.000801323 -0.00926179 -0.00593874
## 8      0.873437 52236.8 -0.000739085 -0.00855367 -0.00596479
##   evenodd_lin_weight num_skipped_modes pump_sp pump_tach_ph
## 3      0.00876018 0 0 0
## 4      0.00865426 0 0 0
## 5      0.00857776 0 0 0
## 6      0.00925833 0 0 0
## 7      0.00854027 0 0 0
## 8      0.00825606 0 0 0

## Warning: Removed 64771 rows containing missing values or values outside the scale range
## ('geom_point()').

```



```
## Warning: Removed 64877 rows containing missing values or values outside the scale range
## ('geom_point()').
```



RAD7 Radon Detector (Durridge) Current Data

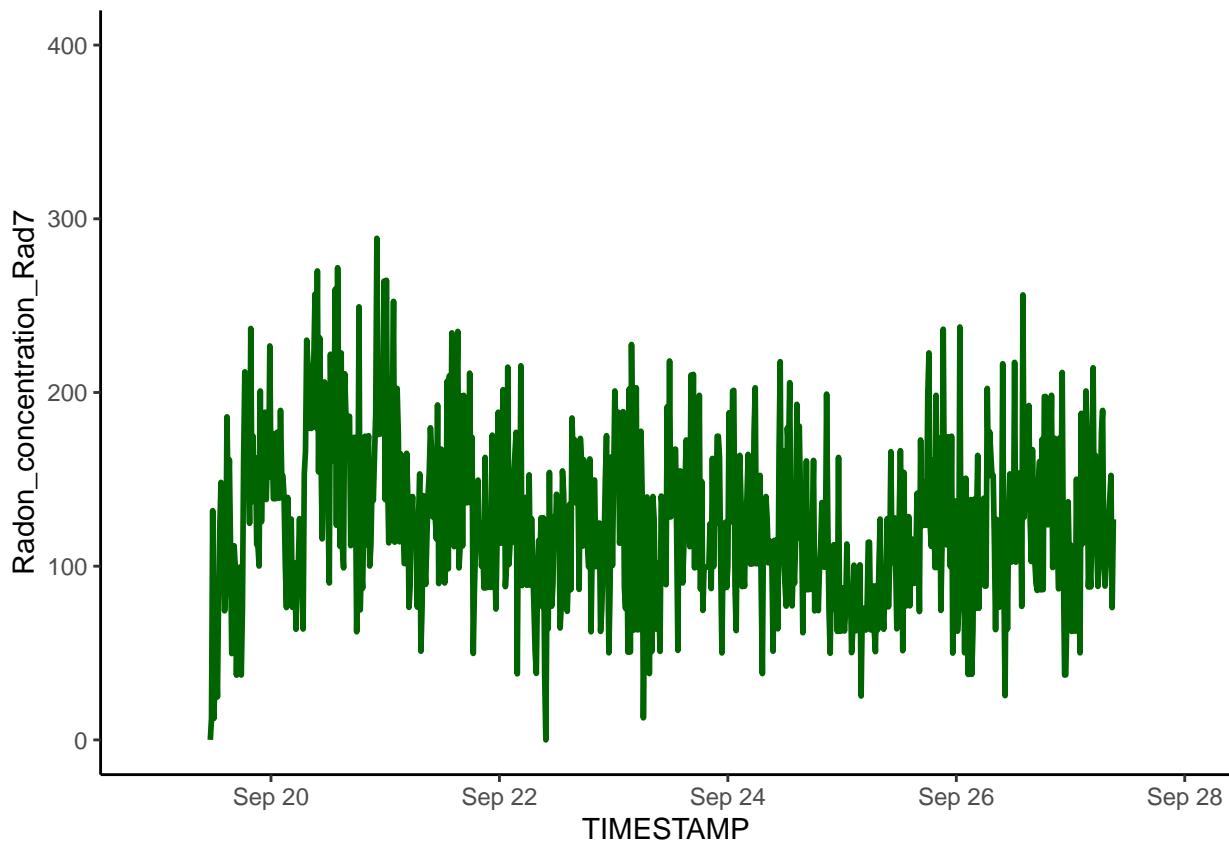
```
##          TIMESTAMP RECORD Record_RAD7 Year_RAD7 Month_RAD7 Day_Rad7
## 3 2024-08-15 17:30:00      4 -2147483648     254      24       8
## 4 2024-08-15 17:45:00      5 -2147483648     254      24       8
## 5 2024-08-15 18:00:00      6      353      24       8      15
## 6 2024-08-15 18:15:00      7      354      24       8      15
## 7 2024-08-15 18:30:00      8      355      24       8      15
## 8 2024-08-15 18:45:00      9      356      24       8      15
##          Hour_Rad7 Minute_Rad7 Total_Counts_Rad7 Live_Time_Rad7 PER_TOT_A_Rad7
## 3           15            15             28              0        4.7
## 4           15            15             33              0        4.7
## 5           15            51              2             14        50
## 6           16             6              6             14       66.7
## 7           16            21              8             14        75
## 8           16            36              9             14       33.3
##          PER_TOT_B_Rad7 PER_TOT_C_Rad7 PER_TOT_D_Rad7 High_Voltage_Level_Rad7
## 3                 0            0            0                  0
## 4                 0            0            0                  0
## 5                 0            0            0                2218
## 6                 0          16.7            0                2218
## 7            12.5          12.5            0                2236
## 8            22.2          44.5            0                2218
##          High_Voltage_Duty_Rad7 Temp_sample_Rad7 RH_sample_Rad7 Leakage_Current_Rad7
## 3                      2218               8            32                  22
```

```

## 4          2218          8          32          16
## 5          8          31.7         11          2
## 6          8          31.7          8          2
## 7          8          31.4          7          2
## 8          8          30.8          6          2
##   Battery_Volt_Rad7 Pump_current_Rad7 Flags_Byt_Rad7 Radon_concentration_Rad7
## 3          2          7.03         10        132
## 4          2          7.03          0        132
## 5         7.03         10        132      12.35599
## 6         7.03         10        132      49.24961
## 7         7.03         10        132     74.00493
## 8         7.03          0        132     37.00247
##   Radon_concentration_uncertainty_Rad7 Units_Byt_Rad7
## 3                      0        147
## 4                      0        147
## 5        59.65997        254
## 6        79.68754        254
## 7       89.93452        254
## 8       74.00493        254

## Warning: Removed 718 rows containing missing values or values outside the scale range
## ('geom_line()').

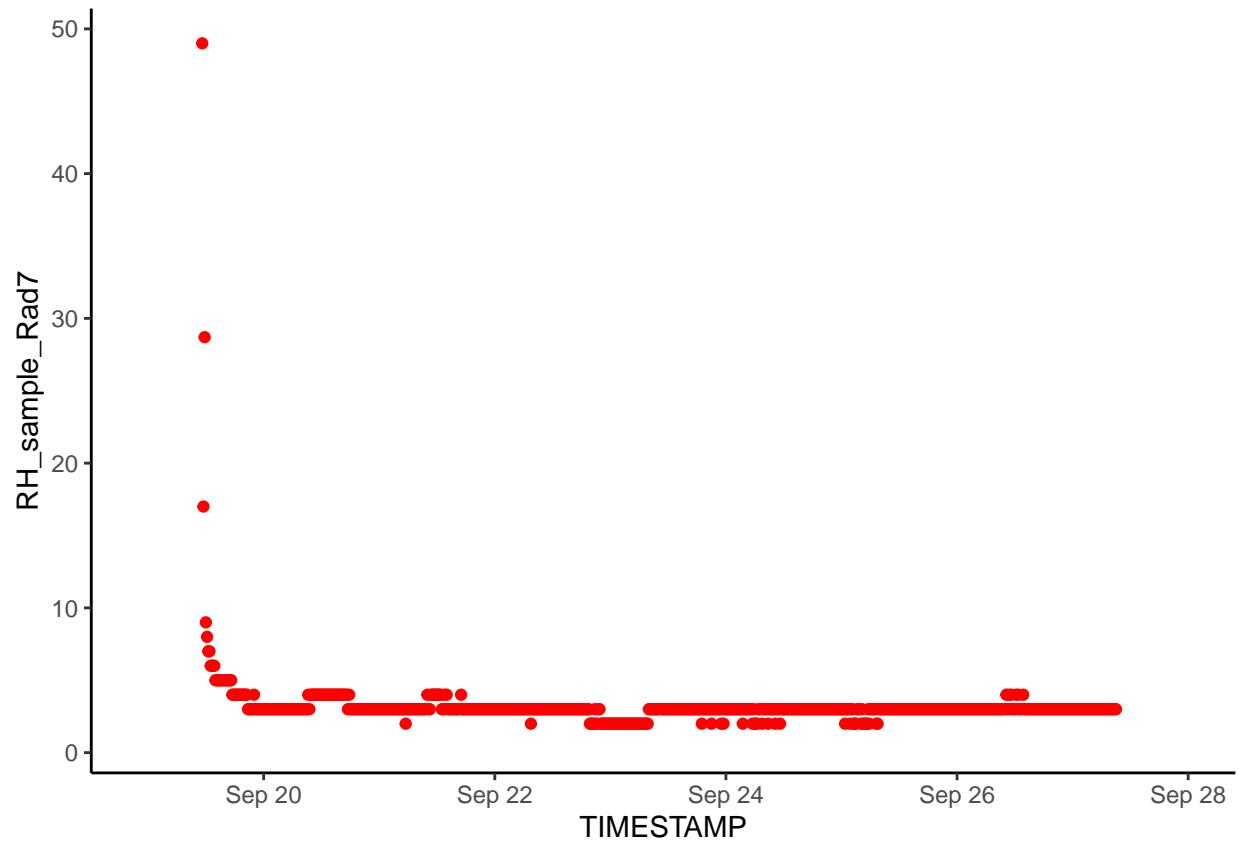
```



```

## Warning: Removed 718 rows containing missing values or values outside the scale range
## ('geom_point()').

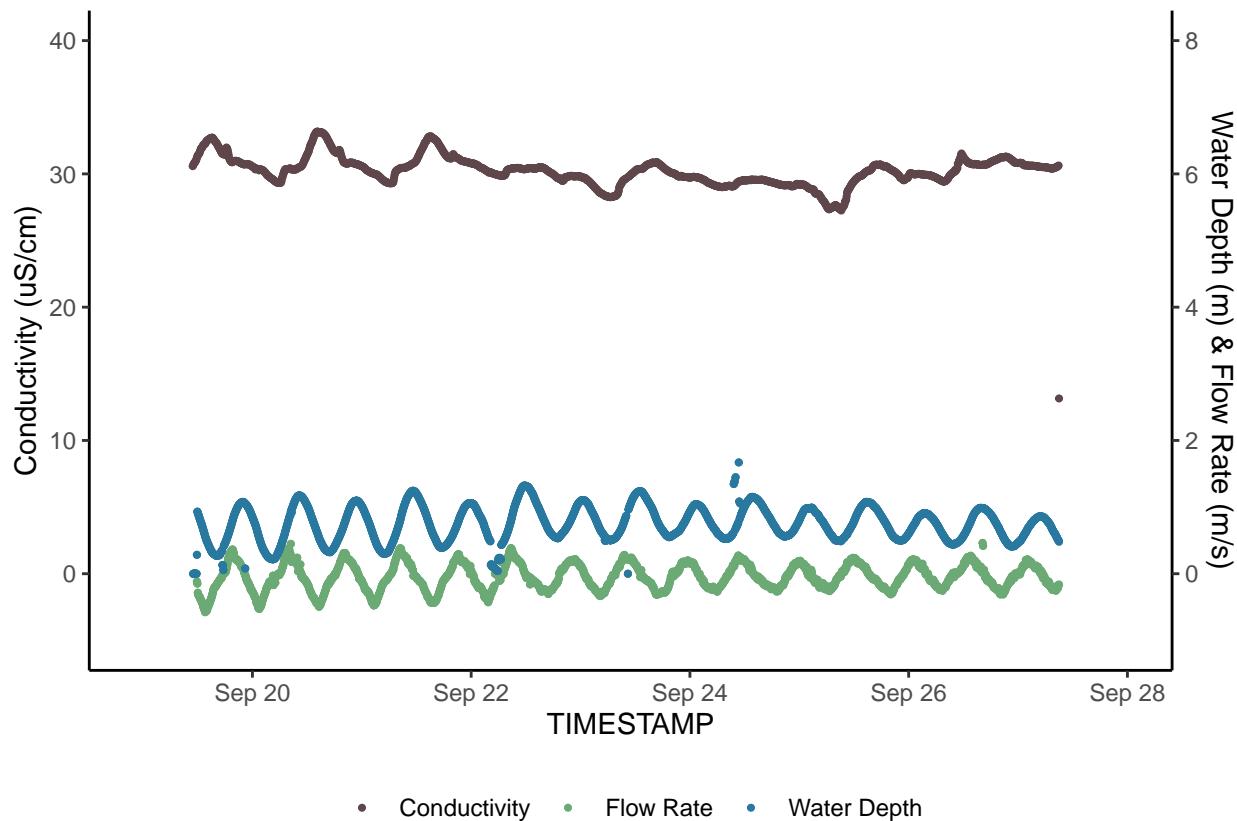
```



Plot variables together to look for patterns

```
## Warning: Removed 1795 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
## Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
```

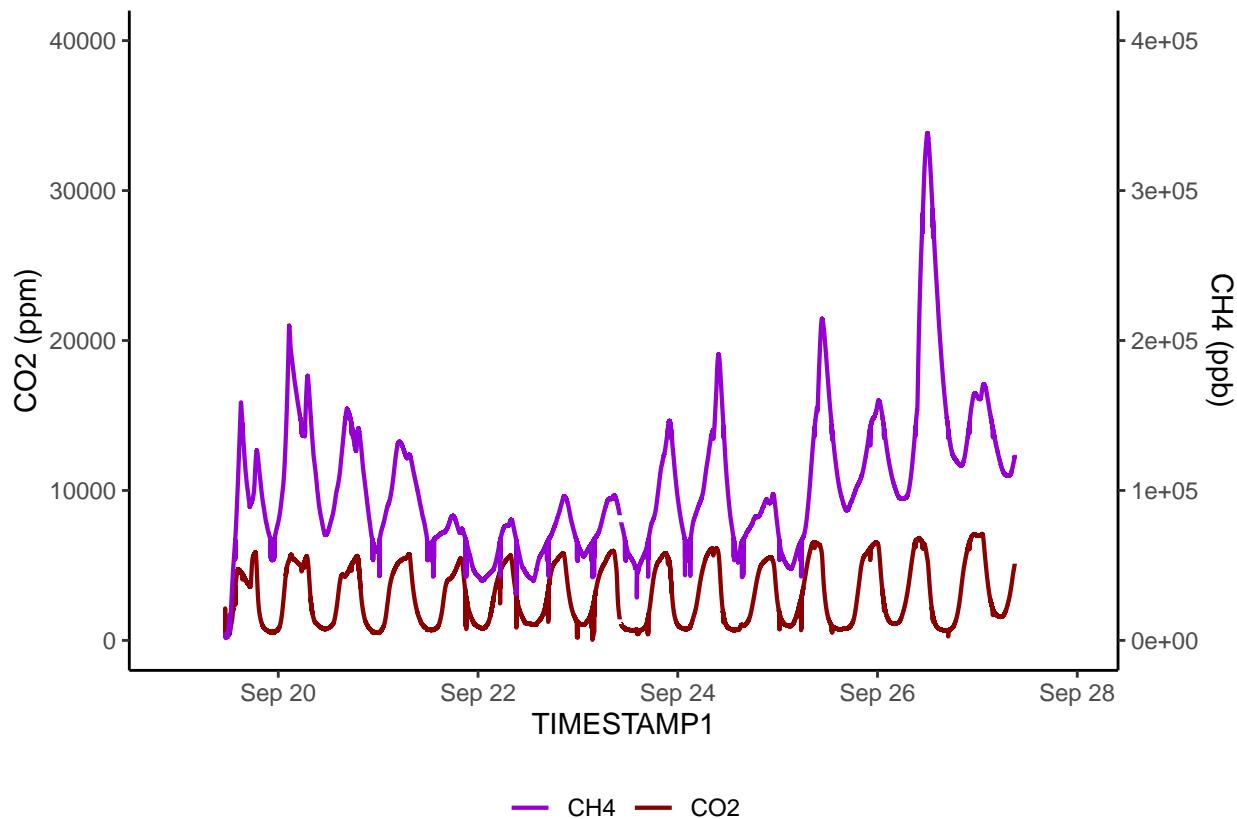


```

## Warning: Using `size` aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use `linewidth` instead.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.

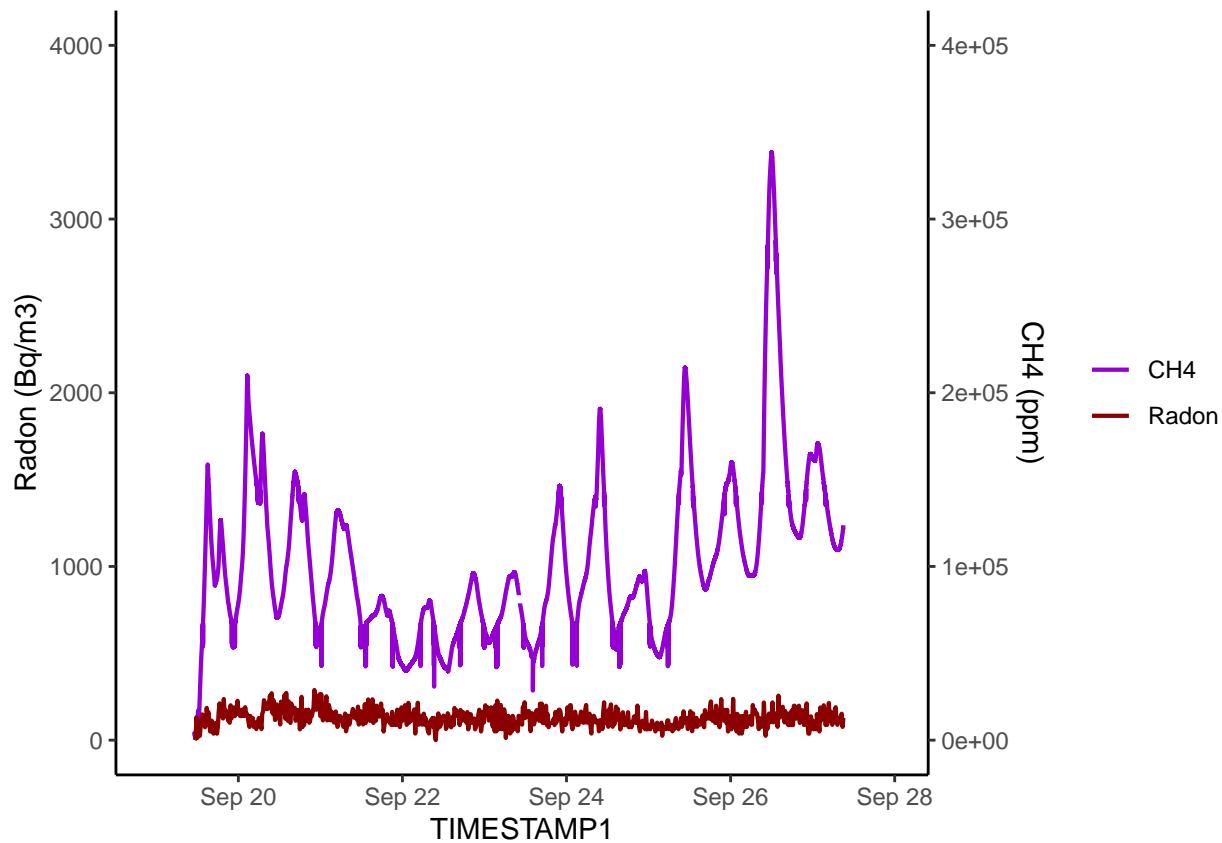
## Warning: Removed 64769 rows containing missing values or values outside the scale range
## (`geom_line()`).
## Removed 64769 rows containing missing values or values outside the scale range
## (`geom_line()`).

```



```
## Warning: Removed 64769 rows containing missing values or values outside the scale range
## ('geom_line()').
```

```
## Warning: Removed 718 rows containing missing values or values outside the scale range
## ('geom_line()').
```



```

## Warning: Removed 1795 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
## Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 64769 rows containing missing values or values outside the scale range
## ('geom_line()').
## Removed 64769 rows containing missing values or values outside the scale range
## ('geom_line()').

```

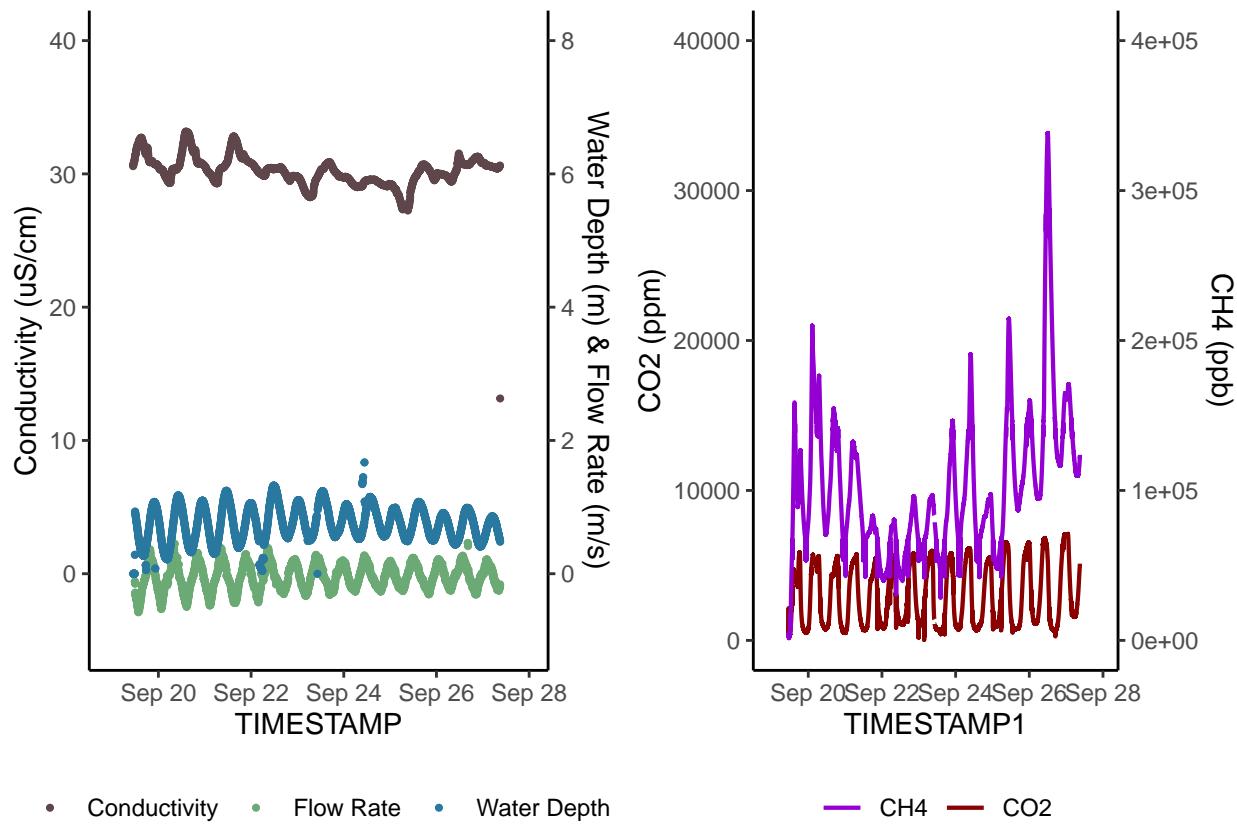
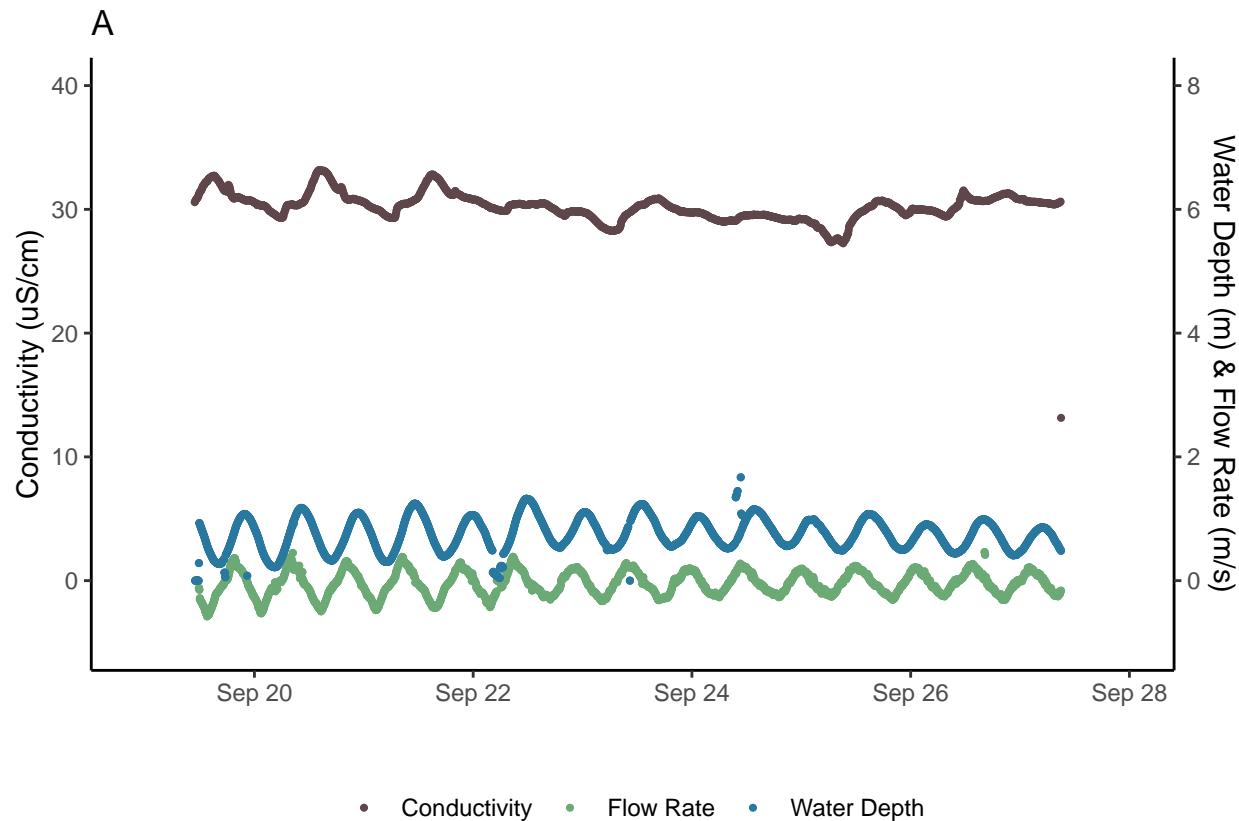


Figure in SARGE Tech Note Paper:

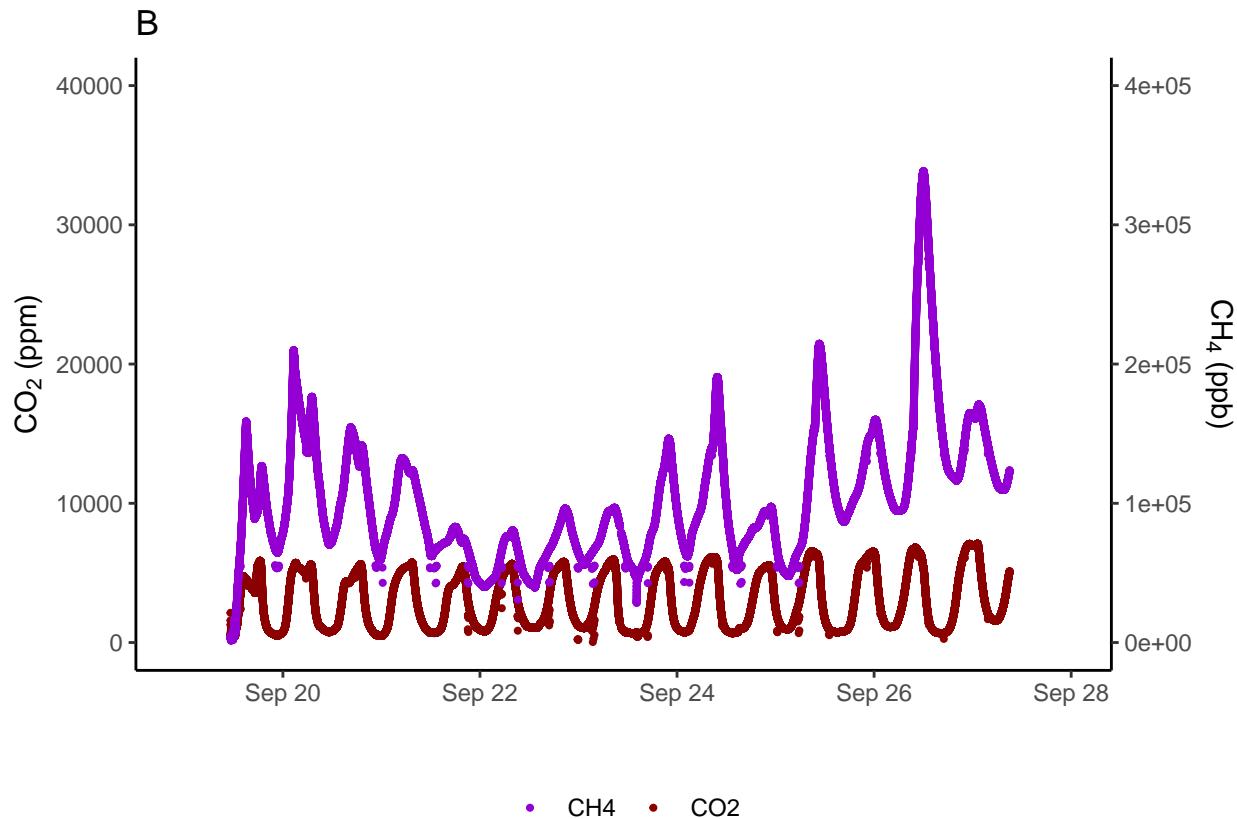
```
## Warning: Removed 1795 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
## Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
```



```
## Warning: Removed 64877 rows containing missing values or values outside the scale range
## ('geom_point()').
```

```
## Warning: Removed 64771 rows containing missing values or values outside the scale range
## ('geom_point()').
```



```
## Warning: Removed 1795 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').
## Removed 1895 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 64877 rows containing missing values or values outside the scale range
## ('geom_point()').

## Warning: Removed 64771 rows containing missing values or values outside the scale range
## ('geom_point()').
```

