

2020-21 OrchardWatch sensor analysis

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```
## Warning: package 'reshape2' was built under R version 4.1.3

## Warning: package 'dplyr' was built under R version 4.1.3

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
## 
##     filter, lag

## The following objects are masked from 'package:base':
## 
##     intersect, setdiff, setequal, union

## Warning: package 'tidyverse' was built under R version 4.1.3

##
## Attaching package: 'tidyverse'

## The following object is masked from 'package:reshape2':
## 
##     smiths

## Using datetime as id variables

## [1] "rh"      "n-main"   "rh"      "n-main"   "rh"      "n-main"   "n-main"
## [9] "rh"      "n-main"

## Warning in matrix(unlist(test_out), ncol = 3, byrow = T): data length [10] is
## not a sub-multiple or multiple of the number of rows [4]

##      [,1]      [,2]      [,3]
## [1,] "rh"      "n-main"   "rh"
## [2,] "n-main"   "rh"      "n-main"
## [3,] "rh"      "n-main"   "rh"
## [4,] "n-main"   "rh"      "n-main"
```

Numeric exploration

```
##  
## Call:  
## lm(formula = nmain_rh$value ~ nmain_temp$value + nmain_wet$value)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max  
## -51.107 -12.786  -1.223  13.703  40.640  
##  
## Coefficients:  
##                         Estimate Std. Error t value Pr(>|t|)  
## (Intercept)      74.169342  0.502371 147.64 <2e-16 ***  
## nmain_temp$value -0.308098  0.009159 -33.64 <2e-16 ***  
## nmain_wet$value    0.429884  0.003341 128.68 <2e-16 ***  
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##  
## Residual standard error: 17.36 on 28626 degrees of freedom  
##   (1144 observations deleted due to missingness)  
## Multiple R-squared:  0.4042, Adjusted R-squared:  0.4041  
## F-statistic:  9708 on 2 and 28626 DF, p-value: < 2.2e-16  
  
## Analysis of Variance Table  
##  
## Response: nmain_temp$value  
##             Df  Sum Sq Mean Sq F value    Pr(>F)  
## nmain_rh$value     1 180206 180206    1462 < 2.2e-16 ***  
## Residuals     29327 3614920        123  
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
  
## Warning in AIC.default(lm(nmain_rh$value ~ nmain_temp$value +  
## nmain_wet$value), : models are not all fitted to the same number of observations  
  
##                                     df      AIC  
## lm(nmain_rh$value ~ nmain_temp$value + nmain_wet$value) 4 244669.3  
## lm(nmain_temp$value ~ nmain_rh$value)                  3 224435.2  
  
##  
## Call:  
## lm(formula = smain_temp$value ~ smain_rh$value)  
##  
## Residuals:  
##      Min       1Q   Median       3Q      Max  
## -29.308  -7.817  -0.364   7.211  34.105  
##  
## Coefficients:  
##                         Estimate Std. Error t value Pr(>|t|)  
## (Intercept)      58.152255  0.207476 280.28 <2e-16 ***  
## smain_rh$value -0.091043  0.003025 -30.09 <2e-16 ***  
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

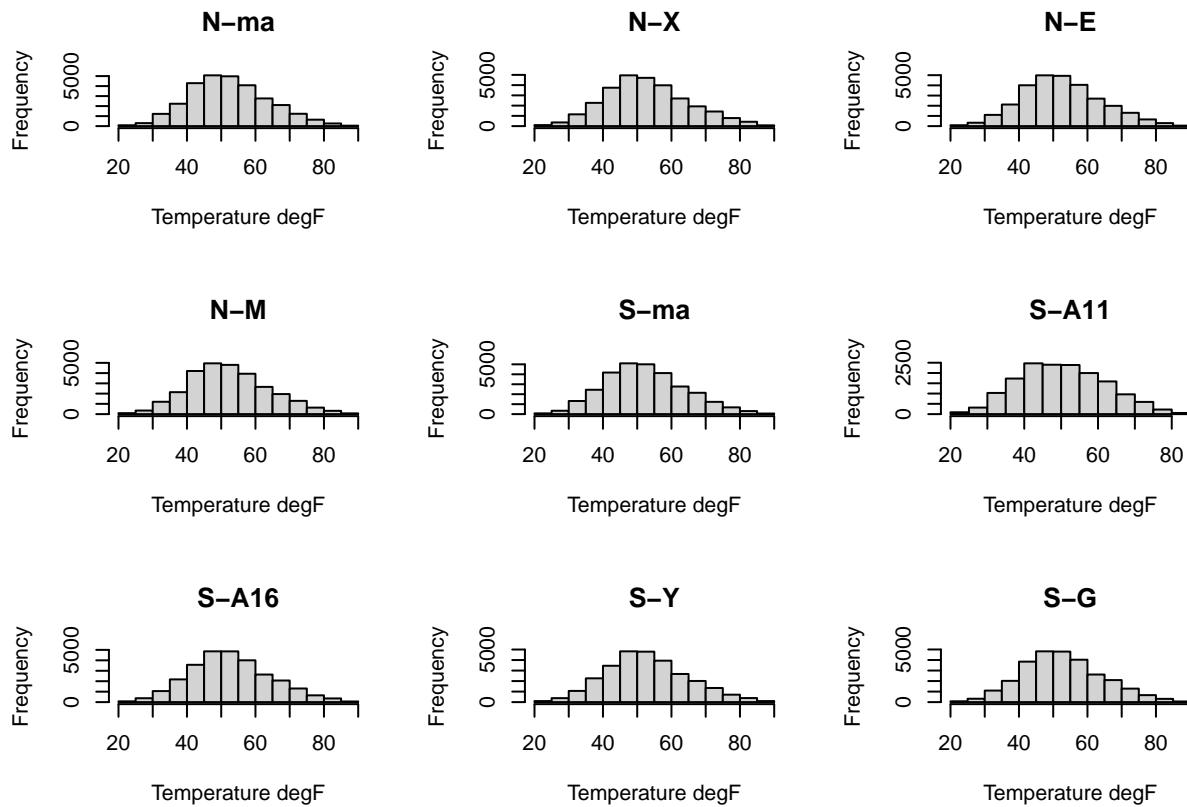
```

## 
## Residual standard error: 11.37 on 29771 degrees of freedom
## Multiple R-squared:  0.02953,   Adjusted R-squared:  0.02949
## F-statistic: 905.7 on 1 and 29771 DF,  p-value: < 2.2e-16

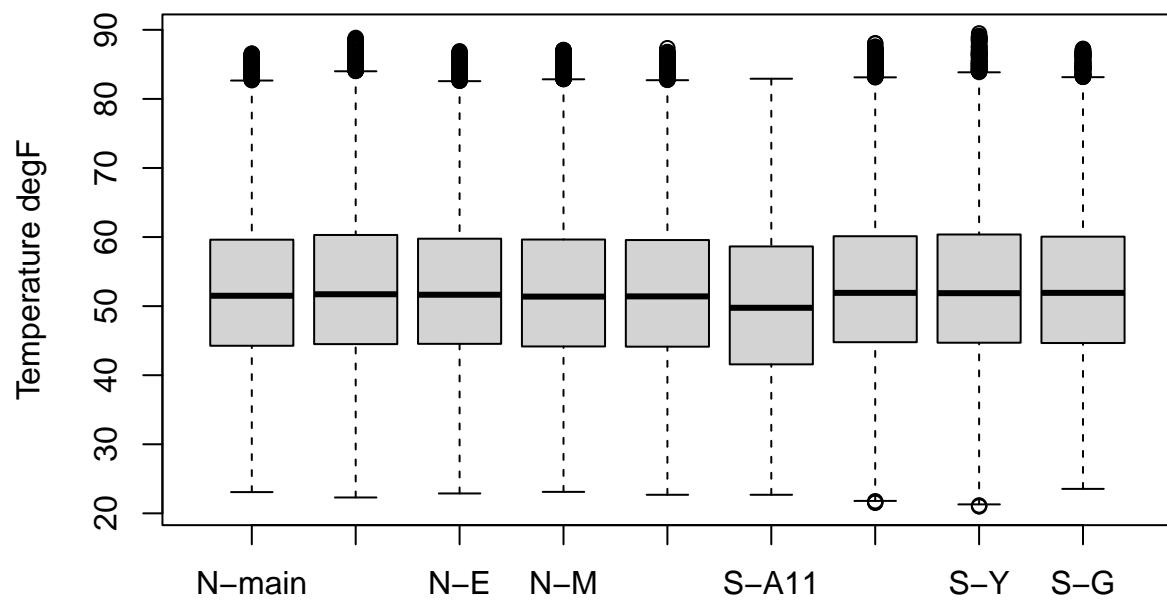
```

Graphical exploration

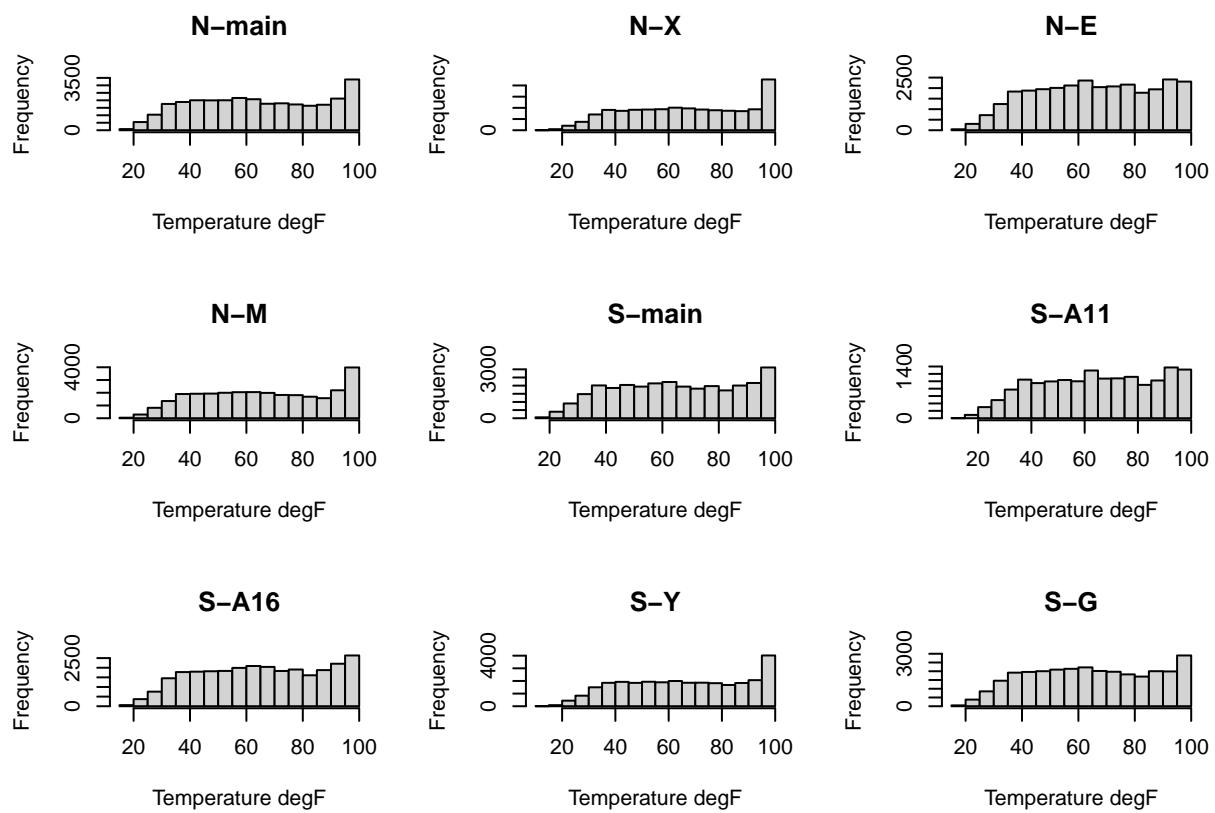
Temperature values by site



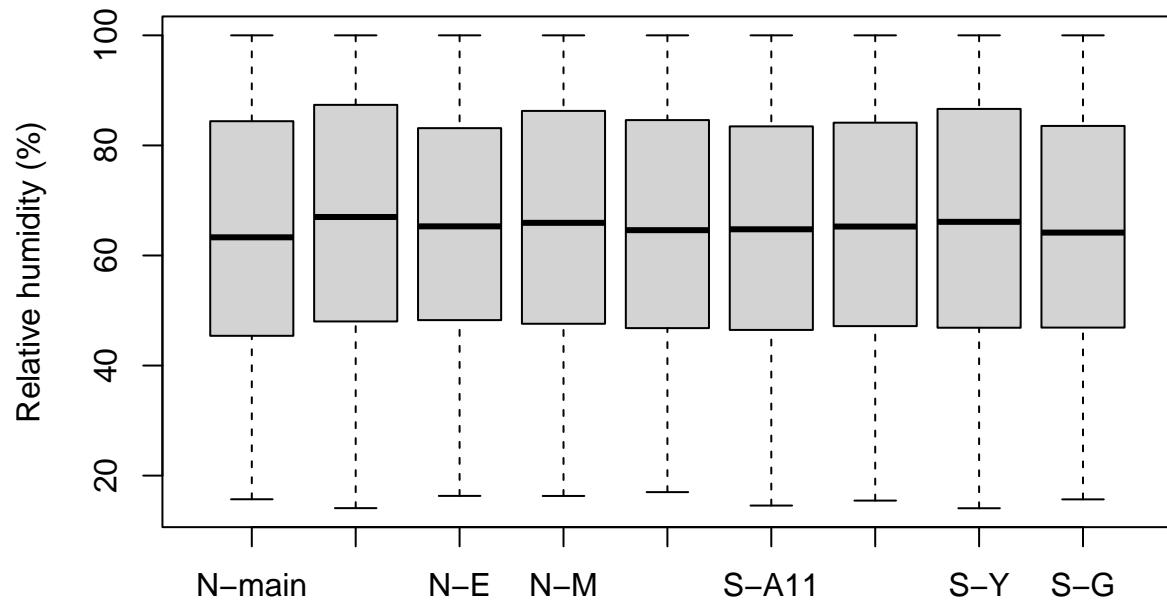
2020–2021 Temperature ranges



Relative humidity values by site



2020–2021 RH ranges



North sites RH ~ leaf wetness

