Customizing QC test thresholds

Version 1 (1/17/2022)

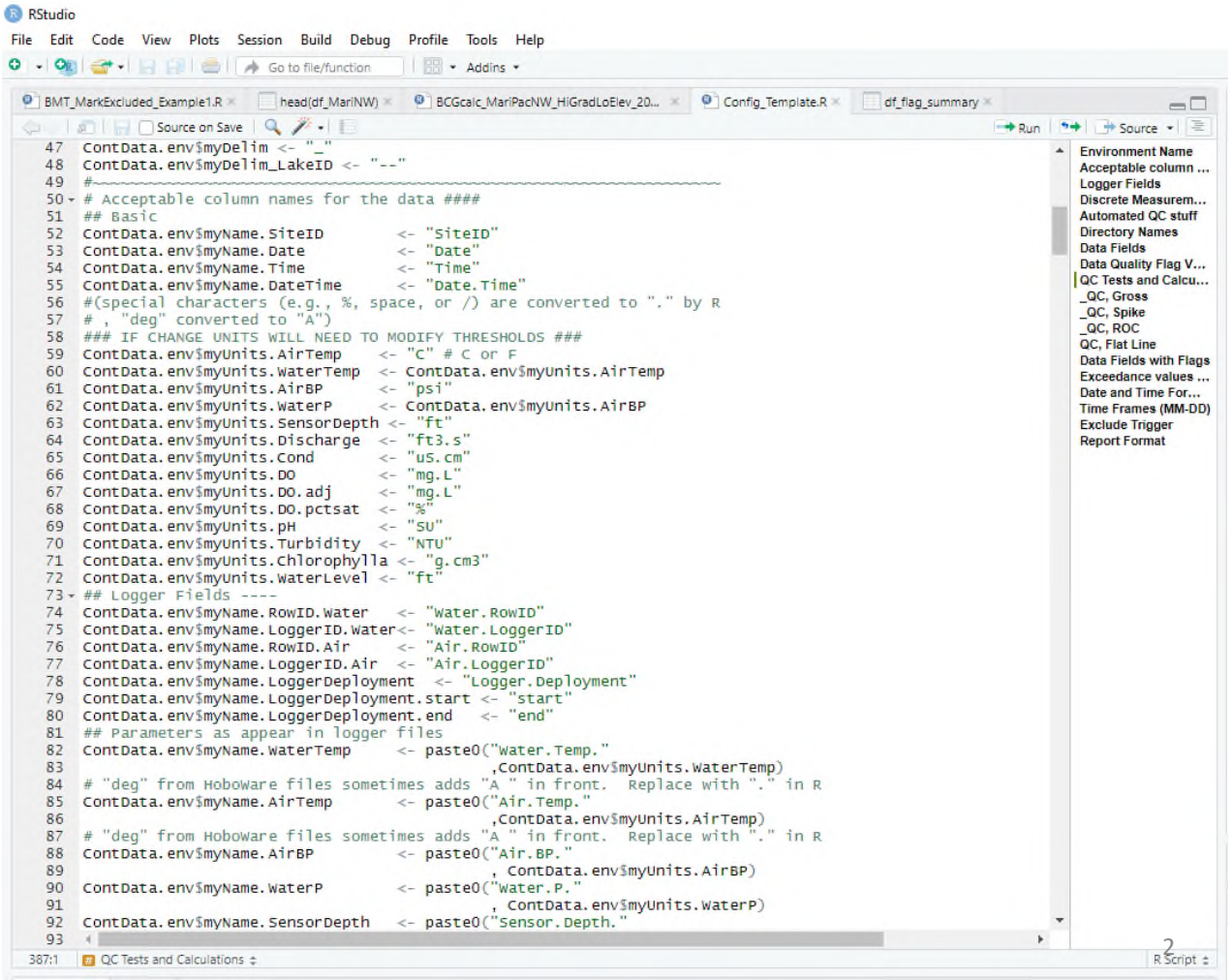
If you decide to change QC test thresholds for a site, you can create and save a customized configuration file for that site and use that customized file each time you run QC reports for that site moving ahead.

What is the configuration file?

It stores information on parameters, units, QC tests and more.

Users with expertise in R can go into this file and edit or add parameters, change units, change QC test thresholds and more.

If you use the Default settings, you won't need to interact with the configuration file at all.



How do you customize the thresholds?

There are two main options:

- Create a customized configuration file using the interactive functions under the 'Edit thresholds' tab.

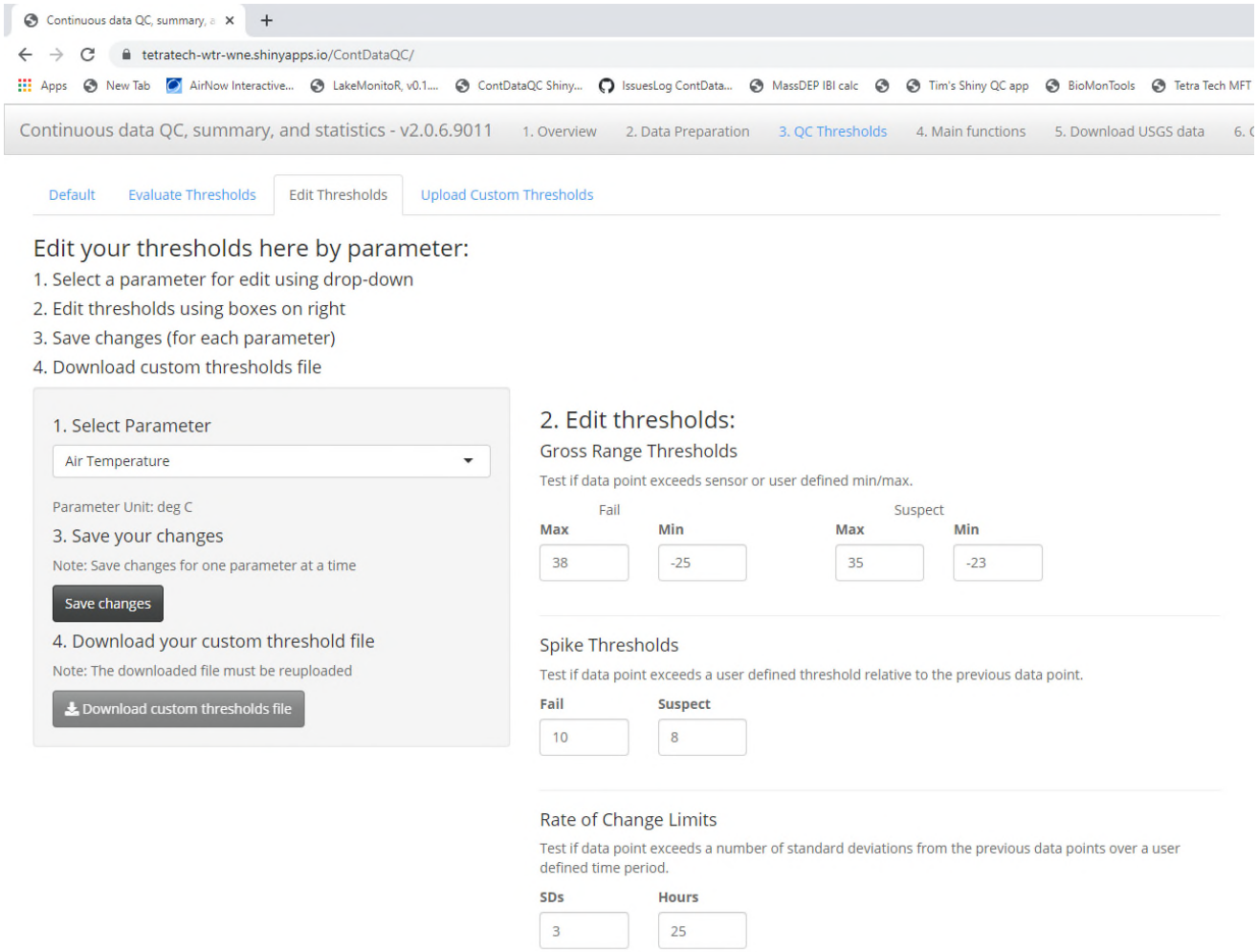
- Download the default configuration file*, open the configuration file in R, or, if you don't have access to R, use Notepad or Notepad ++ to make edits.

*units in the default file = feet; if you prefer to work in meters, download the lakes configuration file

You can download R from this website: https://cran.r-project.org/
You may also want to consider downloading RStudio as well. This is a separate program but is a useful code editor and interface for R. Install it after installing R - https://www.rstudio.com/products/rstudio/download/

If you can't install R on your computer, we recommend use Notepad or Notepad + + (https://notepad-plus-plus.org/downloads/); some people prefer Notepad ++ because it has color-coding.

Option 1 – create a customized configuration file using the features under the ‘Edit thresholds’ tab

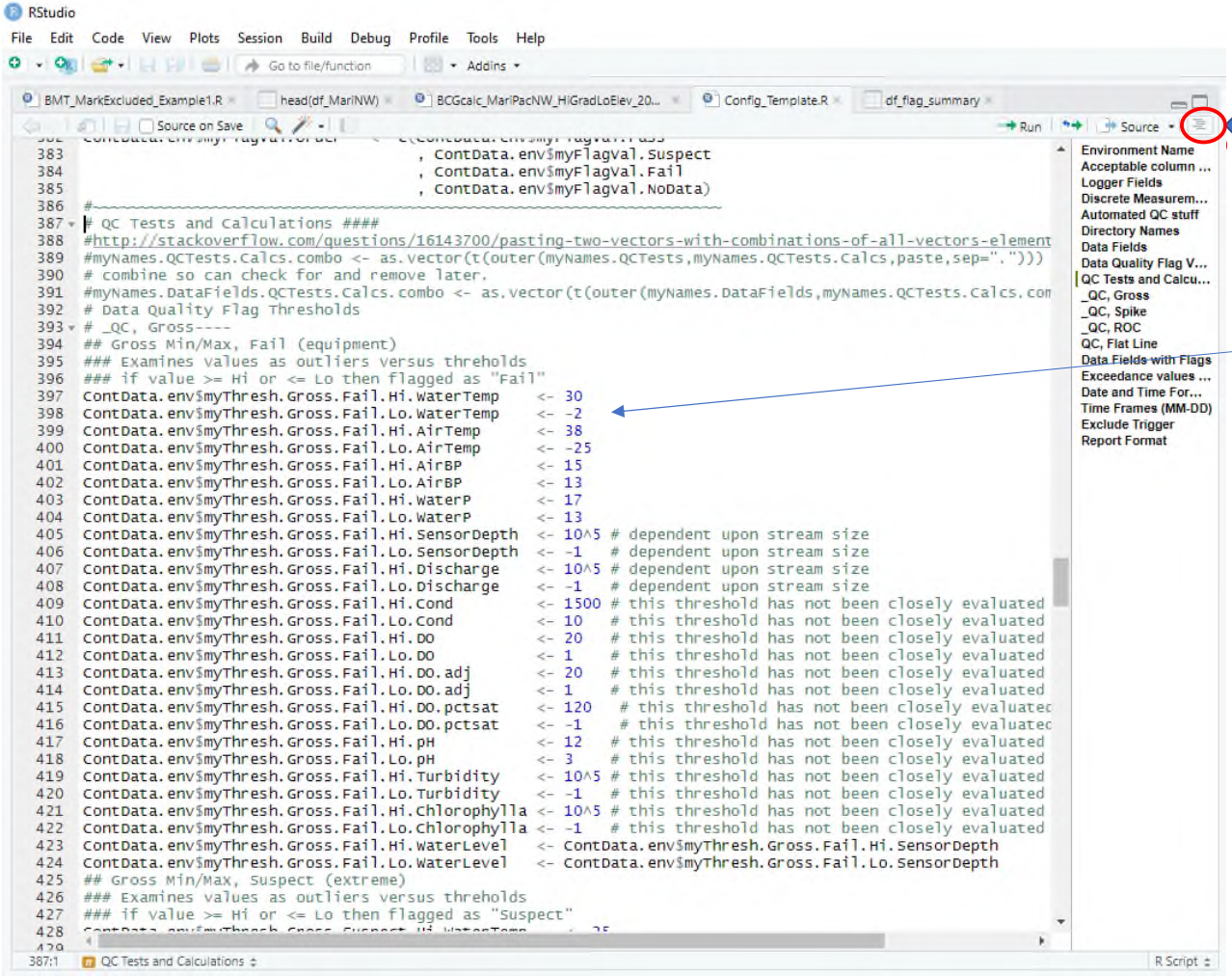


Remember to save changes for each parameter!

Then, after you finish editing thresholds for all parameters, click the ‘download custom thresholds file’ button.

Save the customized file.

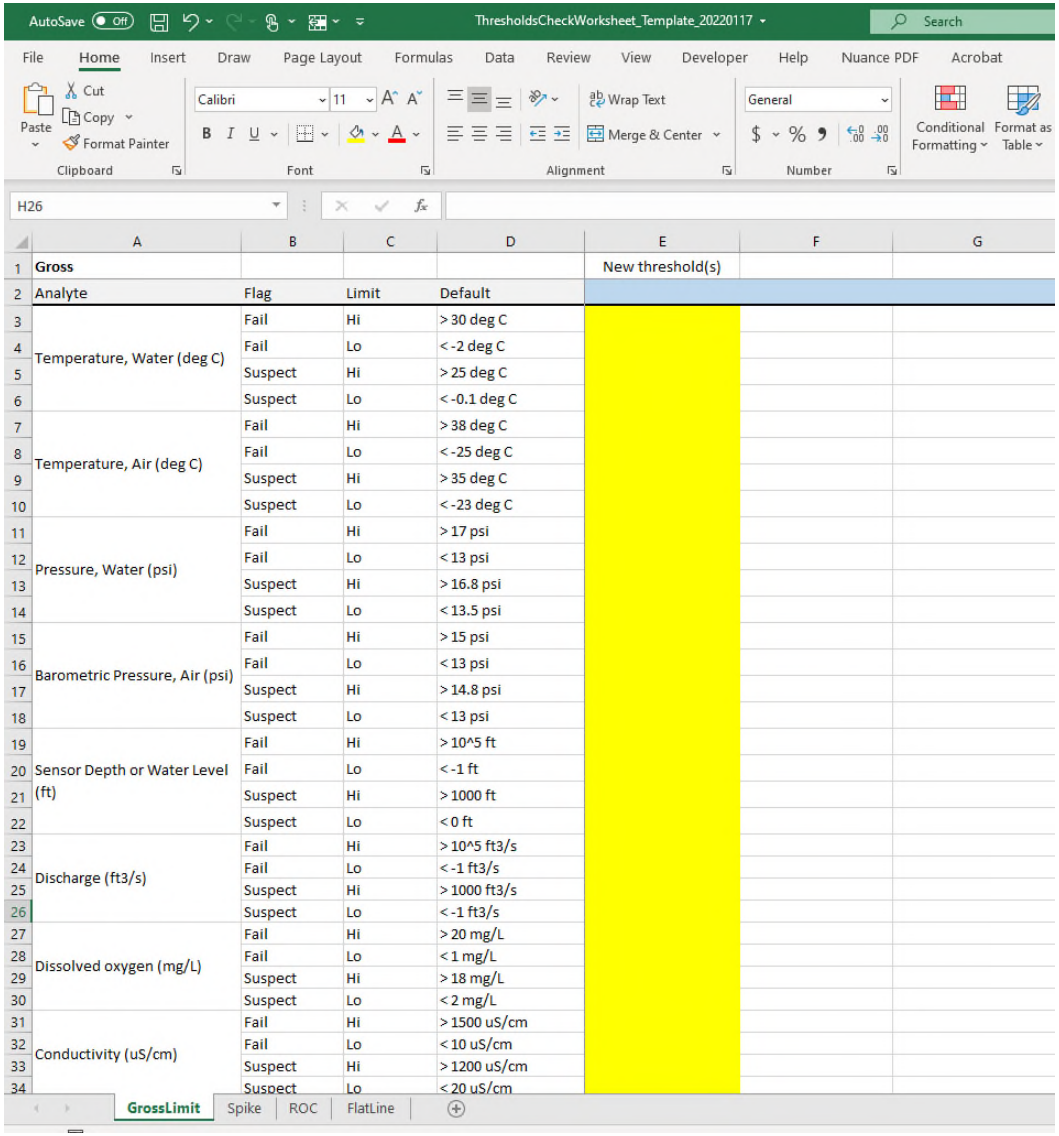
Option 2 – download and edit the configuration file (either the default file (units = feet) or the lakes file (units = meters)




```
                                    , ContData.env$myFlagVal.Suspect
                                    , ContData.env$myFlagVal.Fail
                                    , ContData.env$myFlagVal.NoData)
#~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
# QC Tests and Calculations ####
#http://stackoverflow.com/questions/16143700/pasting-two-vectors-with-combinations-of-all-vectors-element
#myNames.QCTests.Calcs.combo <- as.vector(t(outer(myNames.QCTests,myNames.QCTests.Calcs,paste,sep=".")))
# combine so can check for and remove later.
#myNames.DataFields.QCTests.Calcs.combo <- as.vector(t(outer(myNames.DataFields,myNames.QCTests.Calcs.com
# Data Quality Flag Thresholds
# _QC, Gross----
## Gross Min/Max, Fail (equipment)
### Examines values as outliers versus threholds
### if value >= Hi or <= Lo then flagged as "Fail"
ContData.env$myThresh.Gross.Fail.Hi.WaterTemp    <- 30
ContData.env$myThresh.Gross.Fail.Lo.WaterTemp    <- -2
ContData.env$myThresh.Gross.Fail.Hi.AirTemp      <- 38
ContData.env$myThresh.Gross.Fail.Lo.AirTemp      <- -25
ContData.env$myThresh.Gross.Fail.Hi.AirBP        <- 15
ContData.env$myThresh.Gross.Fail.Lo.AirBP        <- 13
ContData.env$myThresh.Gross.Fail.Hi.WaterP       <- 17
ContData.env$myThresh.Gross.Fail.Lo.WaterP       <- 13
ContData.env$myThresh.Gross.Fail.Hi.SensorDepth  <- 10^5 # dependent upon stream size
ContData.env$myThresh.Gross.Fail.Lo.SensorDepth  <- -1   # dependent upon stream size
ContData.env$myThresh.Gross.Fail.Hi.Discharge    <- 10^5 # dependent upon stream size
ContData.env$myThresh.Gross.Fail.Lo.Discharge    <- -1   # dependent upon stream size
ContData.env$myThresh.Gross.Fail.Hi.Cond         <- 1500 # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Lo.Cond         <- 10   # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Hi.DO           <- 20   # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Lo.DO           <- 1    # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Hi.DO.adj       <- 20   # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Lo.DO.adj       <- 1    # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Hi.DO.pctsat    <- 120   # this threshold has not been closely evaluatec
ContData.env$myThresh.Gross.Fail.Lo.DO.pctsat    <- -1    # this threshold has not been closely evaluatec
ContData.env$myThresh.Gross.Fail.Hi.pH           <- 12   # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Lo.pH           <- 3    # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Hi.Turbidity    <- 10^5 # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Lo.Turbidity    <- -1   # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Hi.Chlorophylla <- 10^5 # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Lo.Chlorophylla <- -1   # this threshold has not been closely evaluated
ContData.env$myThresh.Gross.Fail.Hi.WaterLevel   <- ContData.env$myThresh.Gross.Fail.Hi.SensorDepth
ContData.env$myThresh.Gross.Fail.Lo.WaterLevel   <- ContData.env$myThresh.Gross.Fail.Lo.SensorDepth
## Gross Min/Max, Suspect (extreme)
### Examines values as outliers versus threholds
### if value >= Hi or <= Lo then flagged as "Suspect"
```

Steps:

- Open the configuration file.
- Navigate to the 'QC tests and calculations' section
  - Tip: If you click on this symbol, the table of contents will appear. Click on 'QC Tests and Calculations' and it will take you to that section of the R code
- Edit the thresholds as desired, which are ordered as follows:
  - Gross Fail
  - Gross Suspect
  - Spike
  - RoC
  - Flat line



	A	B	C	D	E	F	G
1	**Gross**				New threshold(s)		
2	Analyte	Flag	Limit	Default			
3	Temperature, Water (deg C)	Fail	Hi	> 30 deg C			
4		Fail	Lo	< -2 deg C			
5		Suspect	Hi	> 25 deg C			
6		Suspect	Lo	< -0.1 deg C			
7	Temperature, Air (deg C)	Fail	Hi	> 38 deg C			
8		Fail	Lo	< -25 deg C			
9		Suspect	Hi	> 35 deg C			
10		Suspect	Lo	< -23 deg C			
11	Pressure, Water (psi)	Fail	Hi	> 17 psi			
12		Fail	Lo	< 13 psi			
13		Suspect	Hi	> 16.8 psi			
14		Suspect	Lo	< 13.5 psi			
15	Barometric Pressure, Air (psi)	Fail	Hi	> 15 psi			
16		Fail	Lo	< 13 psi			
17		Suspect	Hi	> 14.8 psi			
18		Suspect	Lo	< 13 psi			
19	Sensor Depth or Water Level (ft)	Fail	Hi	> 10^5 ft			
20		Fail	Lo	< -1 ft			
21		Suspect	Hi	> 1000 ft			
22		Suspect	Lo	< 0 ft			
23	Discharge (ft3/s)	Fail	Hi	> 10^5 ft3/s			
24		Fail	Lo	< -1 ft3/s			
25		Suspect	Hi	> 1000 ft3/s			
26		Suspect	Lo	< -1 ft3/s			
27	Dissolved oxygen (mg/L)	Fail	Hi	> 20 mg/L			
28		Fail	Lo	< 1 mg/L			
29		Suspect	Hi	> 18 mg/L			
30		Suspect	Lo	< 2 mg/L			
31	Conductivity (uS/cm)	Fail	Hi	> 1500 uS/cm			
32		Fail	Lo	< 10 uS/cm			
33		Suspect	Hi	> 1200 uS/cm			
34		Suspect	Lo	< 20 uS/cm			

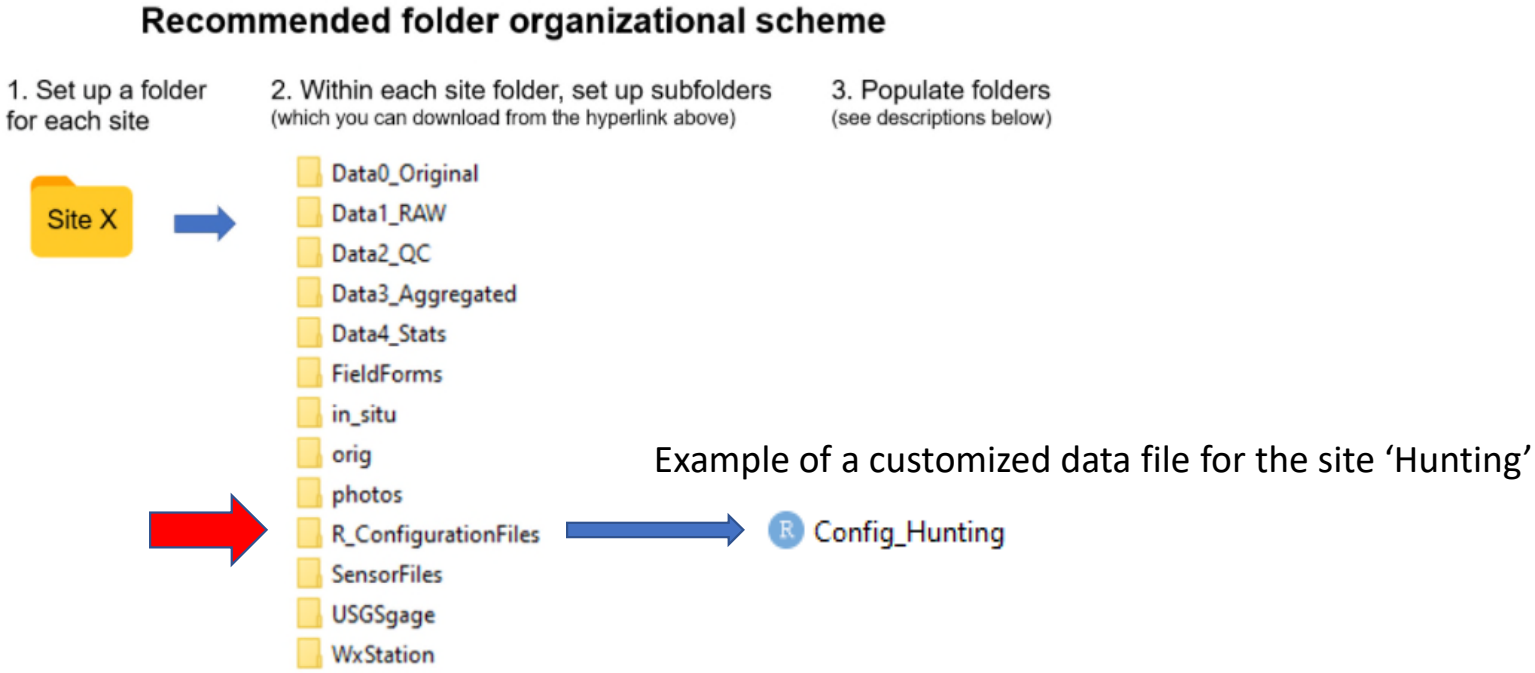
Optional but encouraged-

Reference your ‘threshold check’ worksheet as you work through the edits

Excel file ‘ThresholdsCheckWorksheet_Template_20220117’

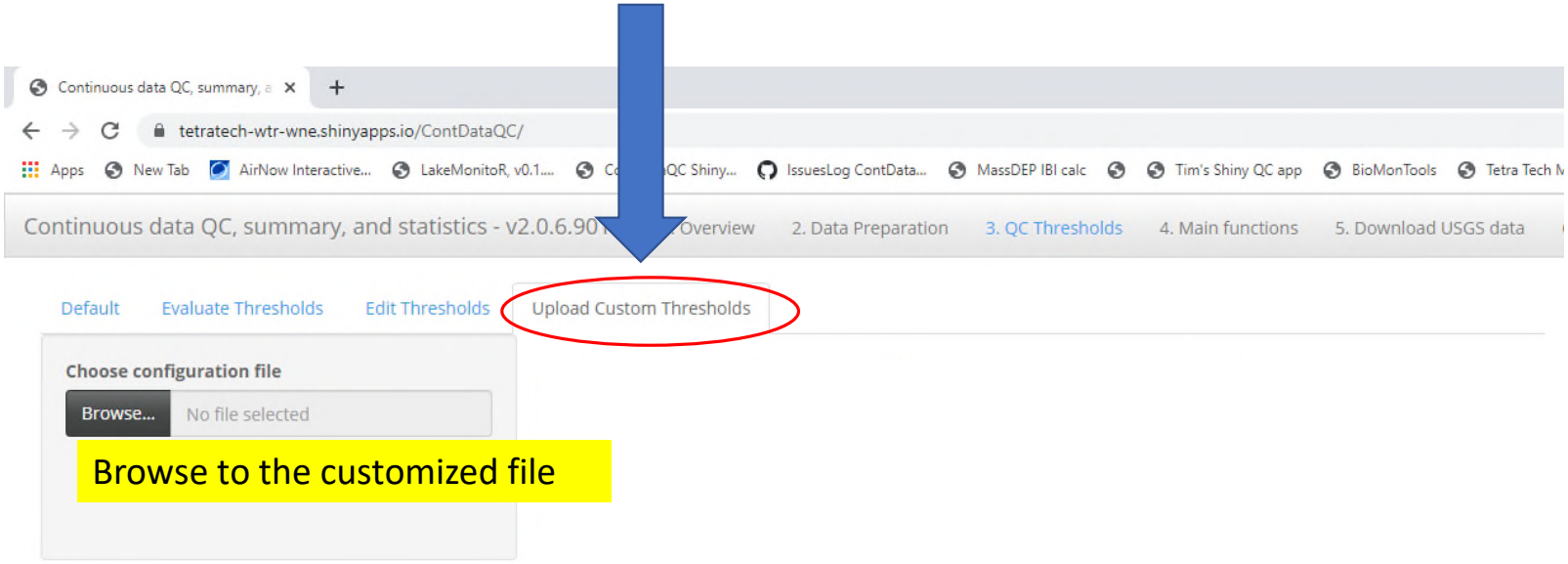
Make sure you save the customized file!

If you use our recommended folder organizational scheme, put the file into the 'R_ConfigurationFiles' folder and include the SiteID in the file name (or if you don't do this, save it in a place that you can easily find the next time you run data for that site through the QC tests).



Make sure you upload the customized configuration file before running the QC tests for your site (otherwise the default thresholds will be used).

Go to the 'Upload custom thresholds' tab, browse to the file and then click 'upload.'



After generating the QC reports, doublecheck that the correct thresholds were used

Open the Word QC report and verify that the correct thresholds are shown in the 'Thresholds, Quick Reference' section

Thresholds, Quick Reference

Analyte	Flag	Gross	Spike	Rate of Change	Flat Line
Temperature, Water (deg C)	Fail	> 30 deg C or < -2 deg C	>= 1.5 deg C (+/-)	NA	> 30 consecutive measurements within 0.01 units of one another
Temperature, Water (deg C)	Suspect	> 25 deg C or < -0.1 deg C	>= 1 deg C (+/-)	>= 3 standard deviations within 25 hours	> 20 consecutive measurements within 0.01 units of one another
Temperature, Air (deg C)	Fail	> 38 deg C or < -25 deg C	>= 10 deg C (+/-)	NA	> 20 consecutive measurements within 0.01 units of one another
Temperature, Air (deg C)	Suspect	> 35 deg C or < -23 deg C	>= 8 deg C (+/-)	>= 3 standard deviations within 25 hours	> 15 consecutive measurements within 0.01 units of one another

Overall flags by parameter