

# Synoptic CB: Porewater Nutrients

April 2023 Samples

2025-07-08

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##Run Information

```
cat("Run Information: Please Read  
)" #lets you know what section you're in
```

## Run Information: Please Read

```
#set the run date & user name  
run_date <- "06/04/2023"  
sample_year <- 2023  
sample_month <- 04  
user <- "Stephanie Wilson"  
  
#identify the files you want to read in  
#read in as a list to accomodate ultiple runs in a month  
NOx_files <- c("Raw Data/SEAL_COMPASS_Synoptic_NOx_April2023_1.csv",  
              "Raw Data/SEAL_COMPASS_Synoptic_NOx_April2023_TEMPEST_May2023_2.csv")  
NH3_PO4_files <- c("Raw Data/SEAL_COMPASS_Synoptic_NH3_PO4_April2023.csv",  
                  "Raw Data/SEAL_COMPASS_Synoptic_NH3_PO4_April2023_TEMPEST_May2023_2.csv")  
  
# Define the file path for QAQC log file - NO Need to change just check year  
file_path <- "Raw Data/SEAL_COMPASS_Synoptic_QAQC_Log_2023.csv"  
final_path <- "Processed Data/COMPASS_Synoptic_Nutrients_202304.csv"  
  
#record any notes about the run or anything other info here:  
run_notes <- "NH3 3rd Party Check off, but all other run  
parameters are fine so accepting this run."  
  
#samples to remove:  
remove <- c("GCW_202304_TR_LysB_10cm_11", "GCW_202304_TR_LysB_20cm_13")  
#these were put on the run twice and can be removed  
  
#Set up file path for metadata  
#downloaded metadata csv - downloaded from Google drive as csv for this year  
Raw_Metadata = "Raw Data/COMPASS_SynopticCB_PW_SampleLog_2023.csv"  
  
cat(run_notes)
```

## NH3 3rd Party Check off, but all other run  
## parameters are fine so accepting this run.

##Setup

##Read in metadata and create similar sample IDs for matching to samples

## 0.1 Import Data & Clean

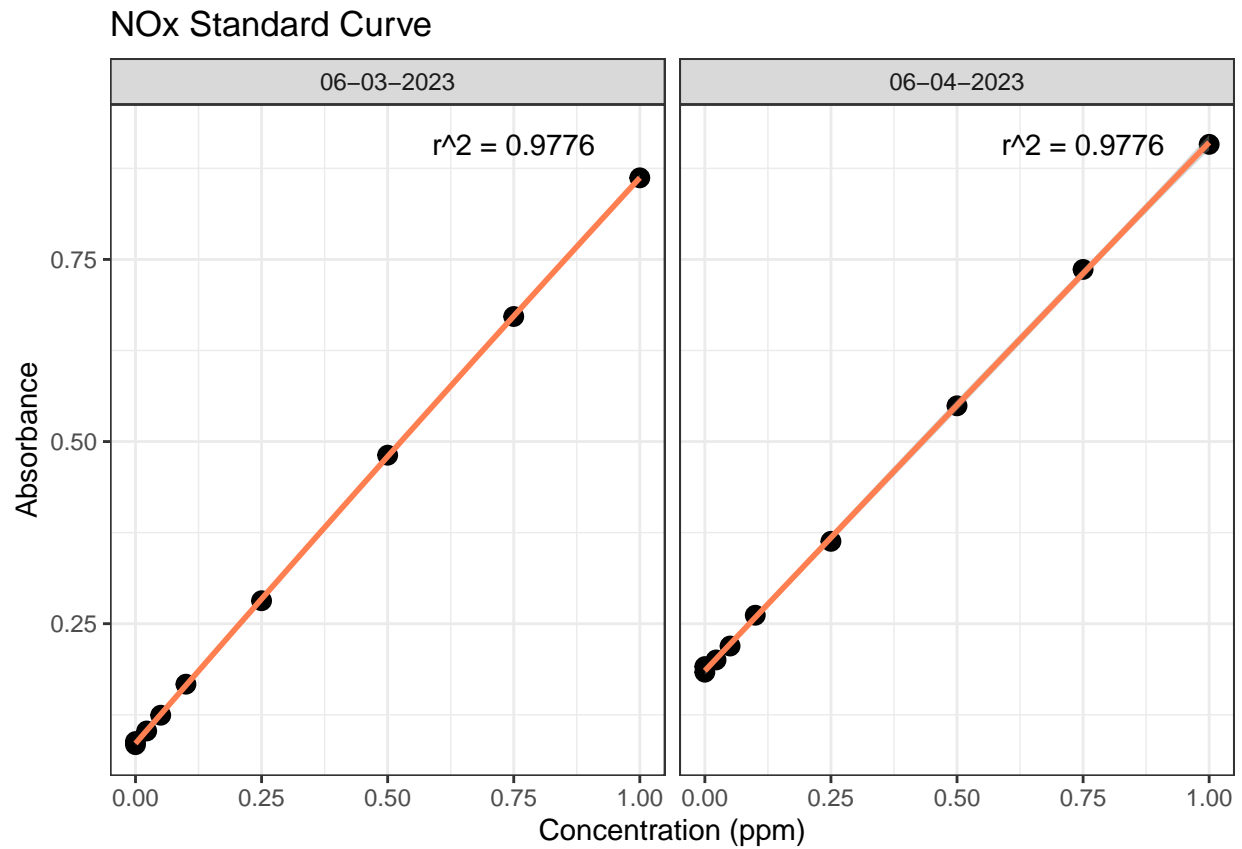
## 0.2 Assessing standard Curves

```
#Pull out standards data
```

```
## Assess Standard Curves
```

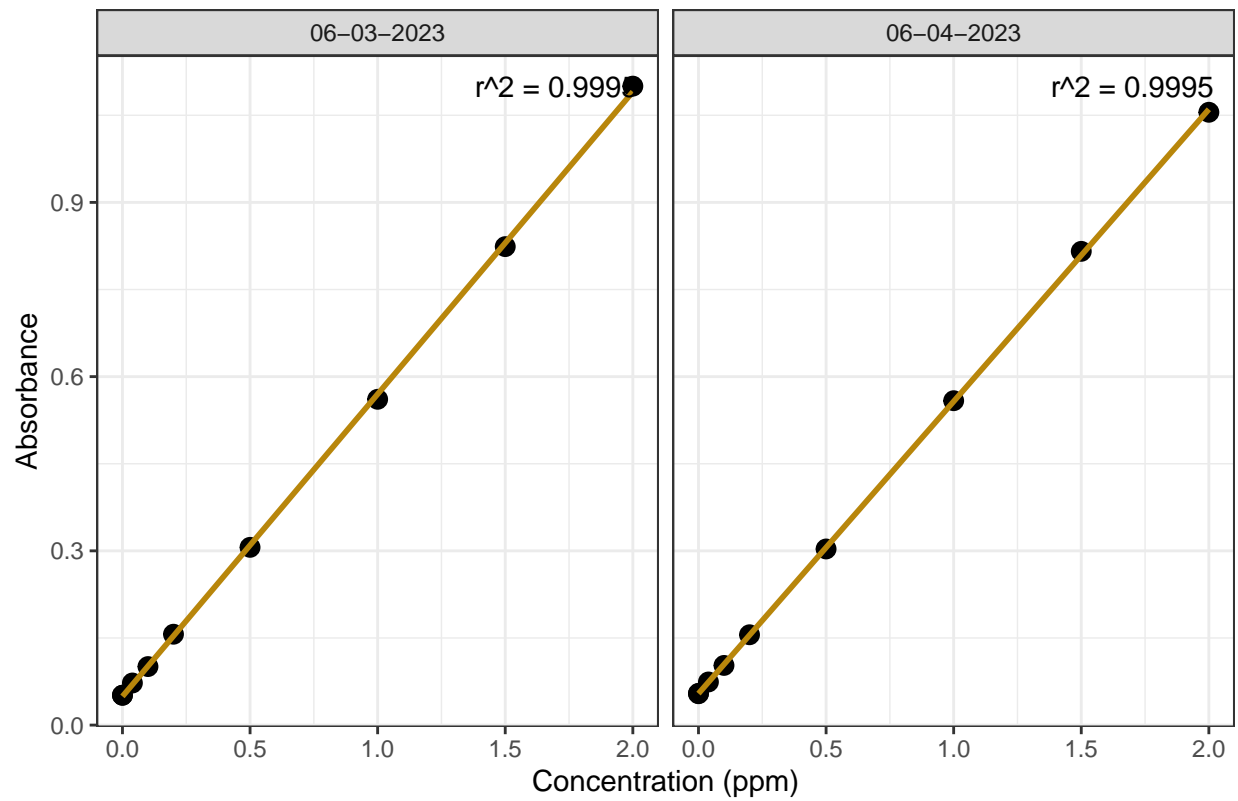
```
#Plot standards data
```

```
## Assess Standard Curves
```



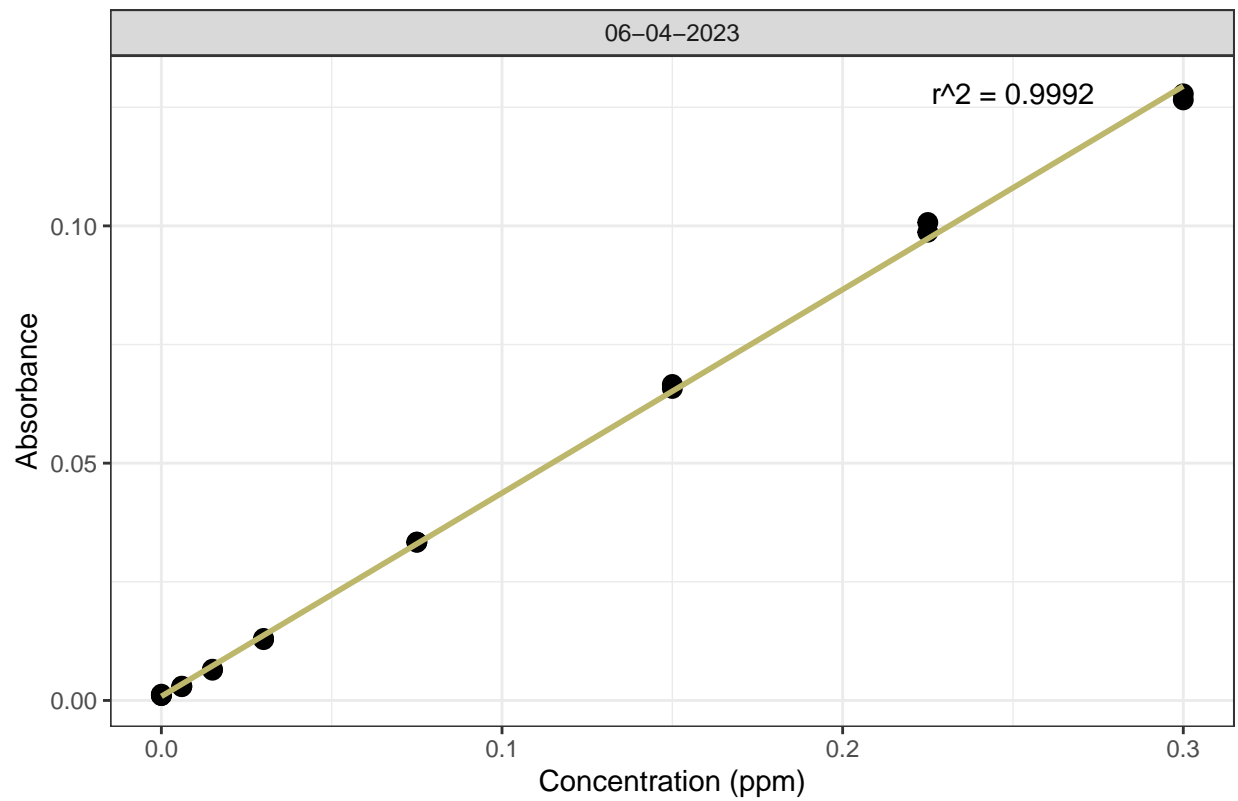
```
## 'geom_smooth()' using formula = 'y ~ x'
```

## NH3 Standard Curve



```
## 'geom_smooth()' using formula = 'y ~ x'
```

## PO4 Standard Curve



```
## [1] "NOx Curve r2 is below cutoff! - REASSESS"
```

```
## [1] "NH3 Curve r2 GOOD - PROCEED"
```

```
## [1] "PO4 Curve r2 GOOD - PROCEED"
```

```
## [1] "QAQC log file exists and has been read into the code."
```

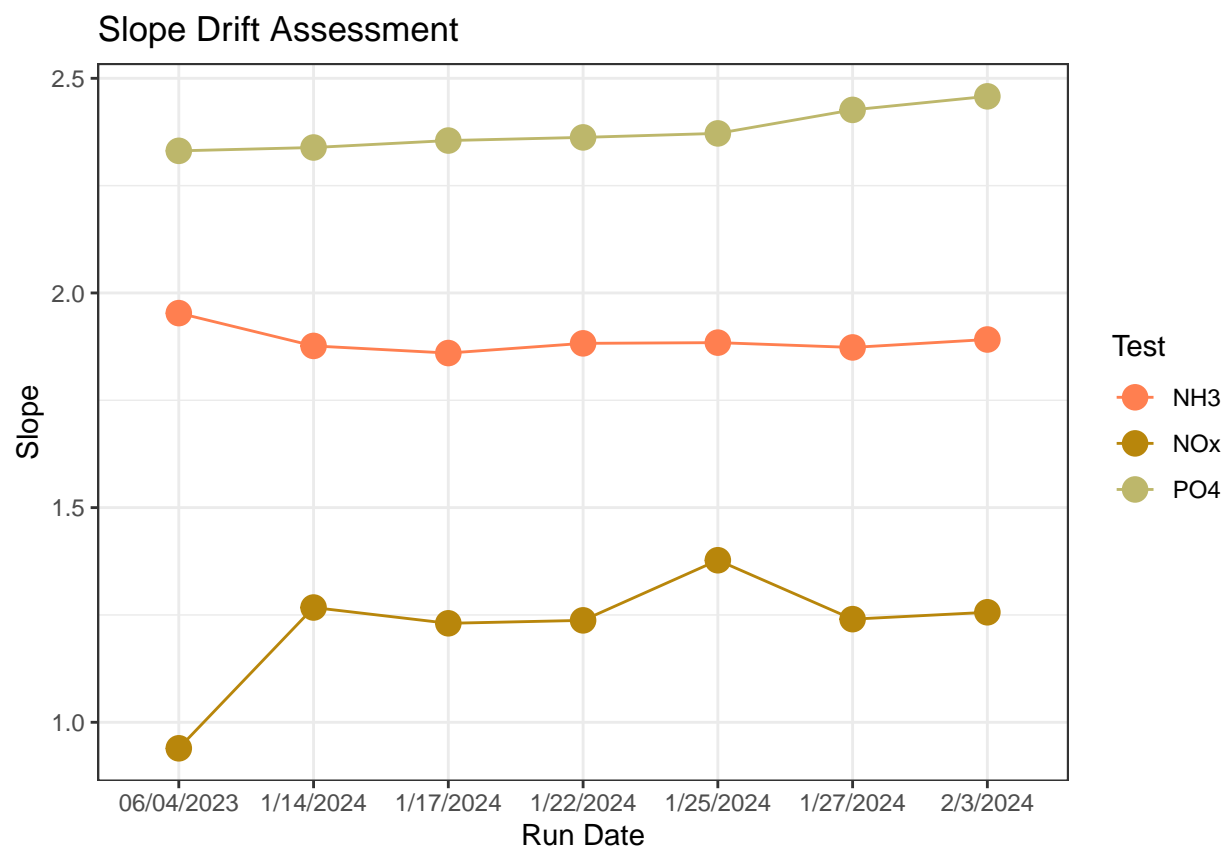


Table 1: Average Slope by Analyte

Test	avg_slope
NH3	1.889
NOx	1.221
PO4	2.378

### 0.3 Dilution Corrections - ensure the latest dilution is kept

```
## Dilution Corrections
```

```
## Duplicated samples: TEMPEST_20230513_CON_C6, MSM_202304_WC_LysC_45cm
```

```
## Duplicated samples with NO dilution present (possible input error): TEMPEST_20230513_CON_C6
```

### 0.4 Performance Check

```
## [1] NA
```

```
## Run mean = NaN
```

```
## Expected = 0.706
```

```
## [1] "NH3 pe Check has a % Difference >25% - REASSESS"
```

```
## Run mean = 1.257933
```

```
## Expected = 0.948
```

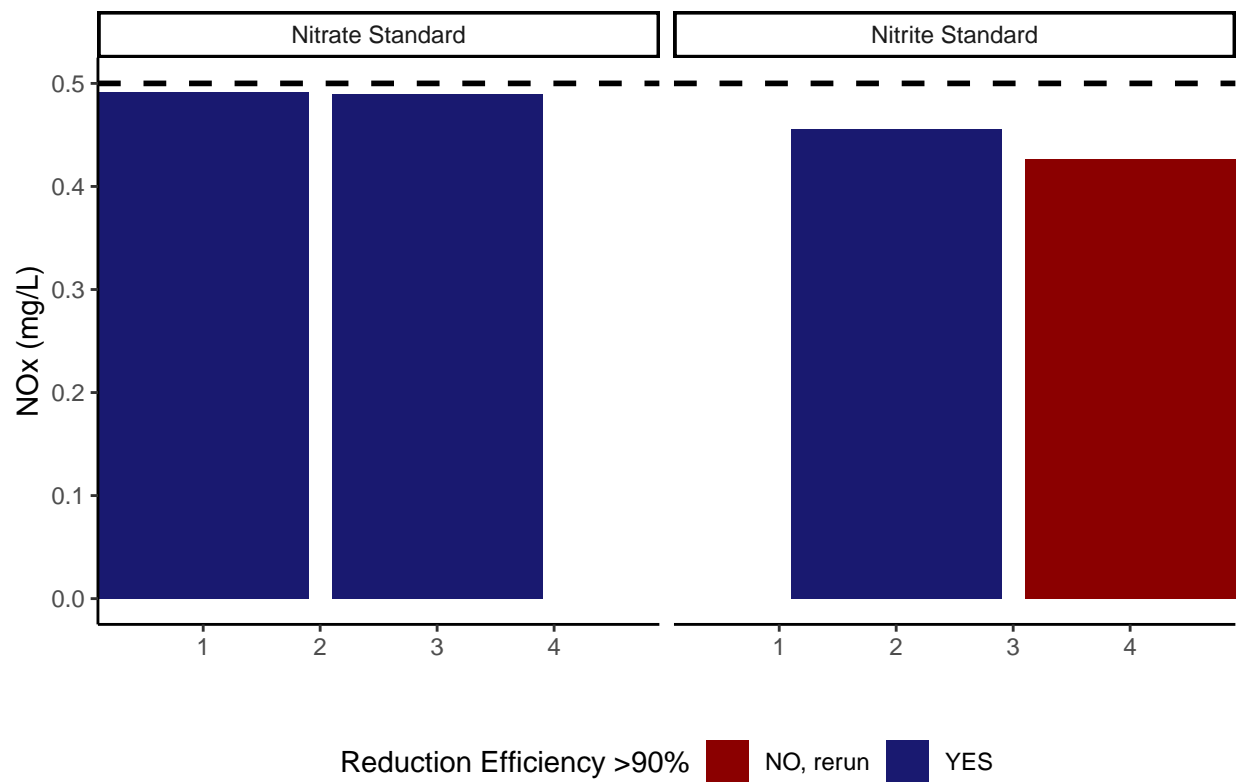
```
## [1] "PO4 pe Check has a % Difference <25% - PROCEED"
```

```
## Run mean = 0.873426
```

```
## Expected = 0.818
```

```
#Check NOx Reduction Efficiency
```

```
## Assess Reduction Efficiency
```



```
## [1] "Mean NOx Reduction Efficiency <95% - REASSESS"
```

```
## [1] 93.1661
```



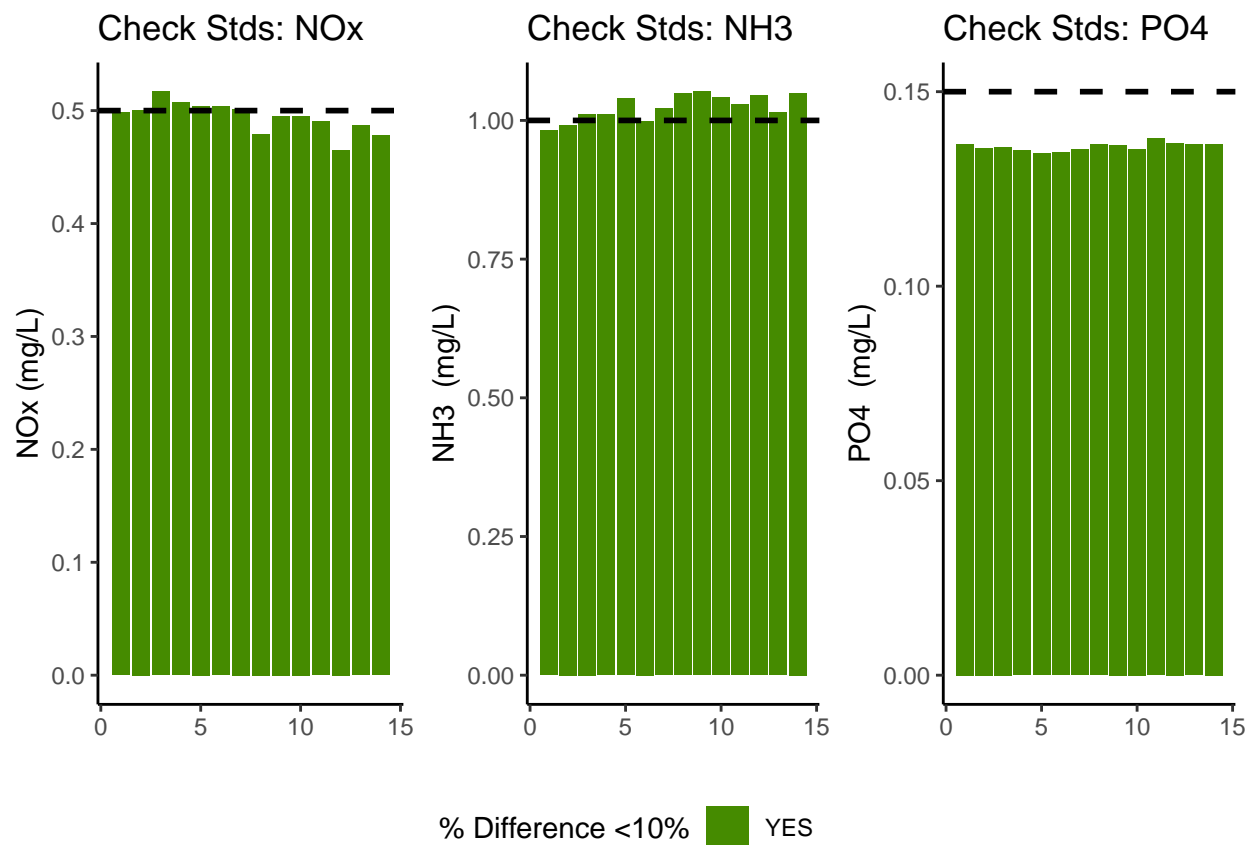
## 0.5 Analyze the Check Standards

```
## Analyze Check Standards
```

```
## [1] "NOx Check Standard RSD within Range - PROCEED"
```

```
## [1] "NH3 Check Standard RSD within Range - PROCEED"
```

```
## [1] "PO4 Check Standard RSD within Range - PROCEED"
```



```
## [1] ">60% of NOx Check Standards are within range of expected concentration - PROCEED"
```

```
## [1] ">60% of NH3 Check Standards are within range of expected concentration - PROCEED"
```

```
## [1] ">60% of PO4 Check Standards are within range of expected concentration - PROCEED"
```

## 0.6 Analyze Blanks

```
## Assess Blanks
```

```
## [1] ">60% of NOx Blanks are below the lower 25% quartile of samples or 1/2 detection limit - PROCEED"
```

```
## [1] ">60% of NH3 Blanks are below the lower 25% quartile of samples - PROCEED"
```

```
## [1] ">60% of PO4 Blanks are below the lower 25% quartile of samples- PROCEED"
```

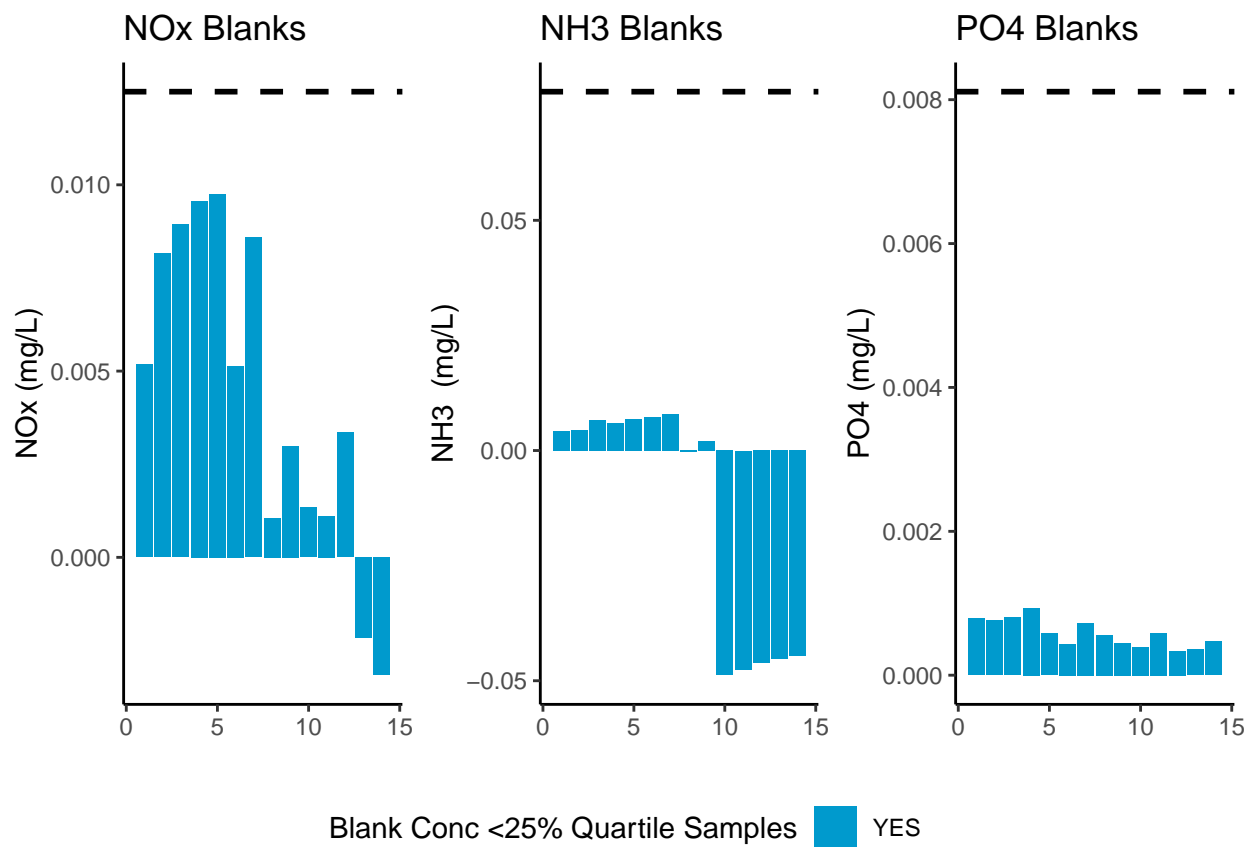


Table 2: Mean Concentration of Blanks

Test	Blank_Mean_Conc
NOx	0.0043
NH3	-0.0134
PO4	0.0006

## 0.7 Analyze Duplicates

```
## Analyze Duplicates
```

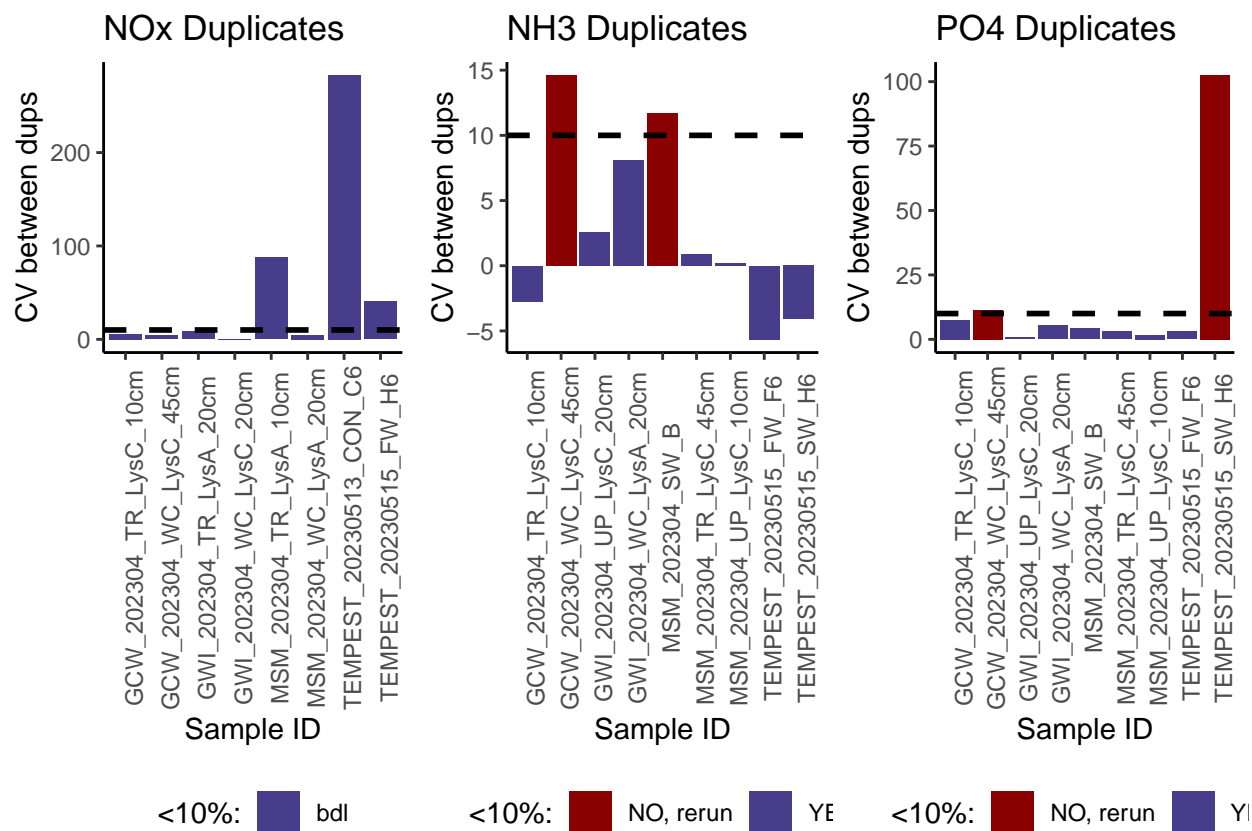
```
## Warning: Returning more (or less) than 1 row per 'summarise()' group was deprecated in
## dplyr 1.1.0.
## i Please use 'reframe()' instead.
## i When switching from 'summarise()' to 'reframe()', remember that 'reframe()'
## always returns an ungrouped data frame and adjust accordingly.
## Call 'lifecycle::last_lifecycle_warnings()' to see where this warning was
## generated.
```

```
## [1] ">60% of NOx Duplicates have a CV <10% - PROCEED"
```

```
## [1] ">60% of NH3 Duplicates have a CV <10% - PROCEED"
```

```
## [1] ">60% of PO4 Duplicates have a CV <10% - PROCEED"
```

```
## 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.
```

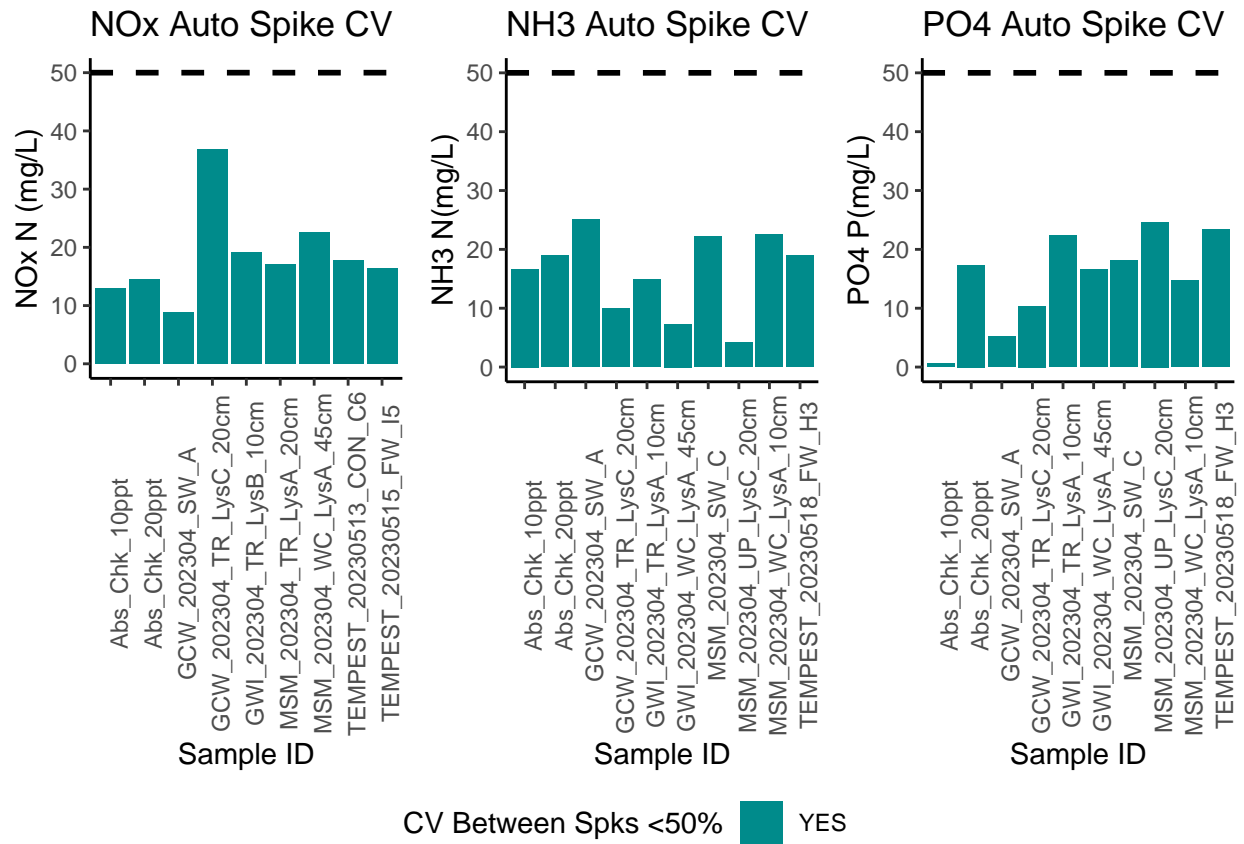


## 0.8 Spikes

```
## [1] ">60% of Spikes have a CV <50% - PROCEED"
```

```
## [1] ">60% of Spikes have a CV <50% - PROCEED"
```

```
## [1] ">60% of Spikes have a CV <50% - PROCEED"
```



## 0.9 Matrix Effects

```
## [1] "NO NOx Matrix Effect, PROCEED"
```

```
## [1] "NO NH3 Matrix Effect, PROCEED"
```

```
## [1] "NO PO4 Matrix Effect, PROCEED"
```

## 0.10 Unit Converted Data Column Added (mg/L to uM )

## 0.11 Sample Flagging - Within range of standard curve

```
## Sample Flagging
```

## 0.12 Pull out sample id information

```
## Sample Processing
```

```
## Warning: Expected 5 pieces. Missing pieces filled with 'NA' in 27 rows [21, 22, 23, 46,  
## 47, 48, 72, 73, 74, 95, 96, 97, 141, 142, 143, 167, 168, 169, 193, 194, ...].
```

## 0.13 Pulling Rhizon Samples

## 0.14 Check to see if samples run match metadata & merge info

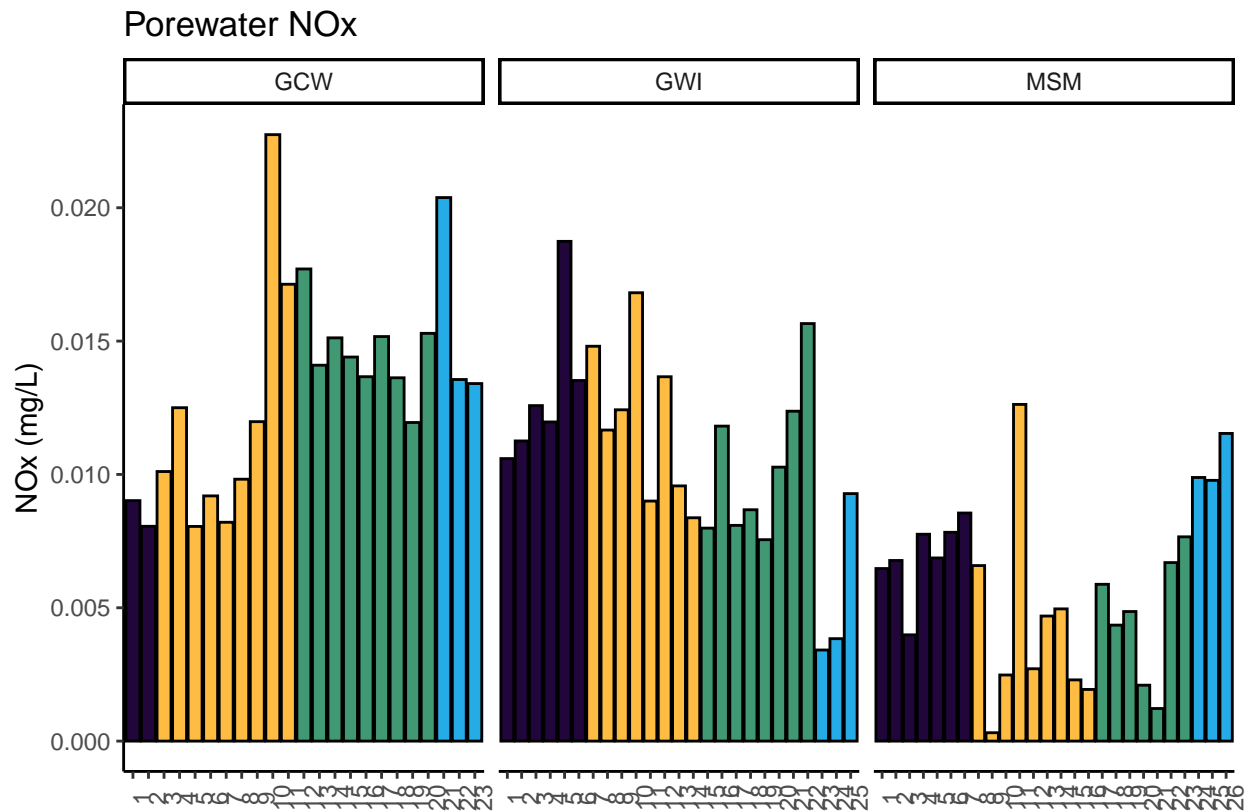
```
## Check Sample IDs with Metadata
```

```
## All sample IDs are present in metadata.
```

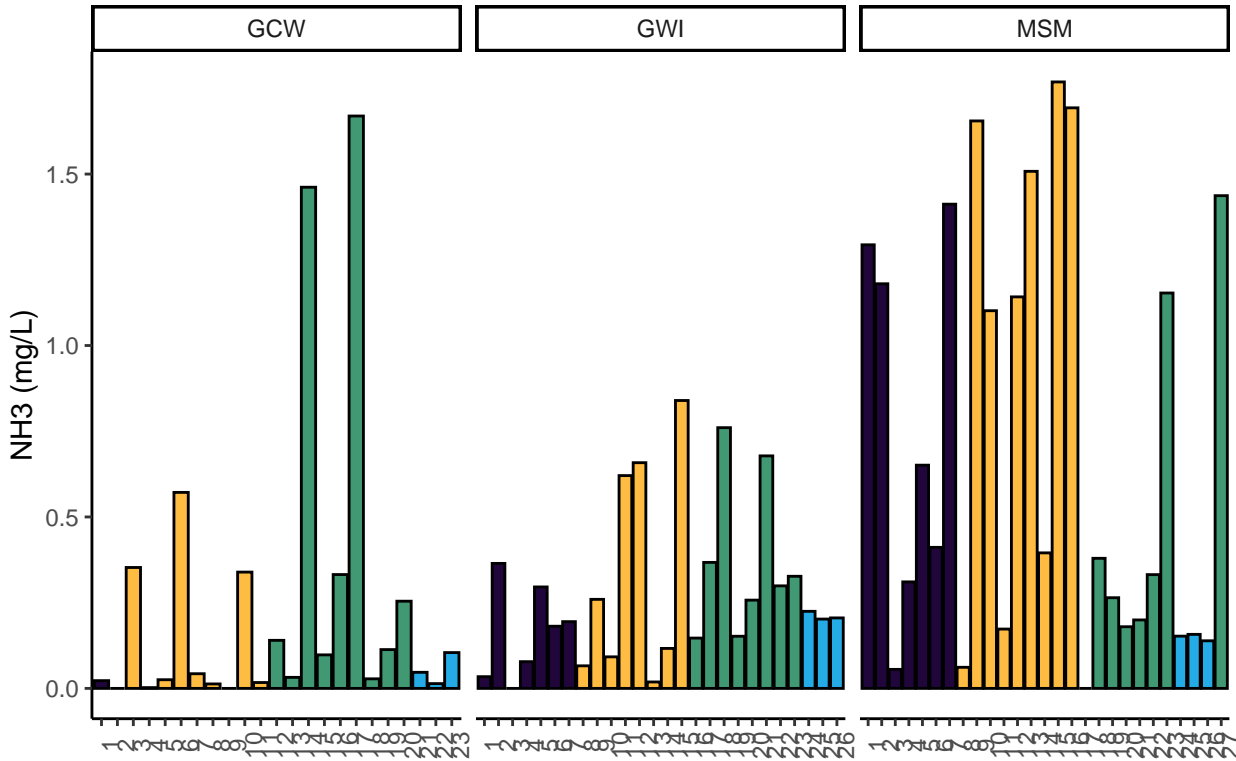
```
## Warning: Expected 5 pieces. Missing pieces filled with 'NA' in 27 rows [21, 22, 23, 46,  
## 47, 48, 72, 73, 74, 95, 96, 97, 141, 142, 143, 167, 168, 169, 193, 194, ...].
```

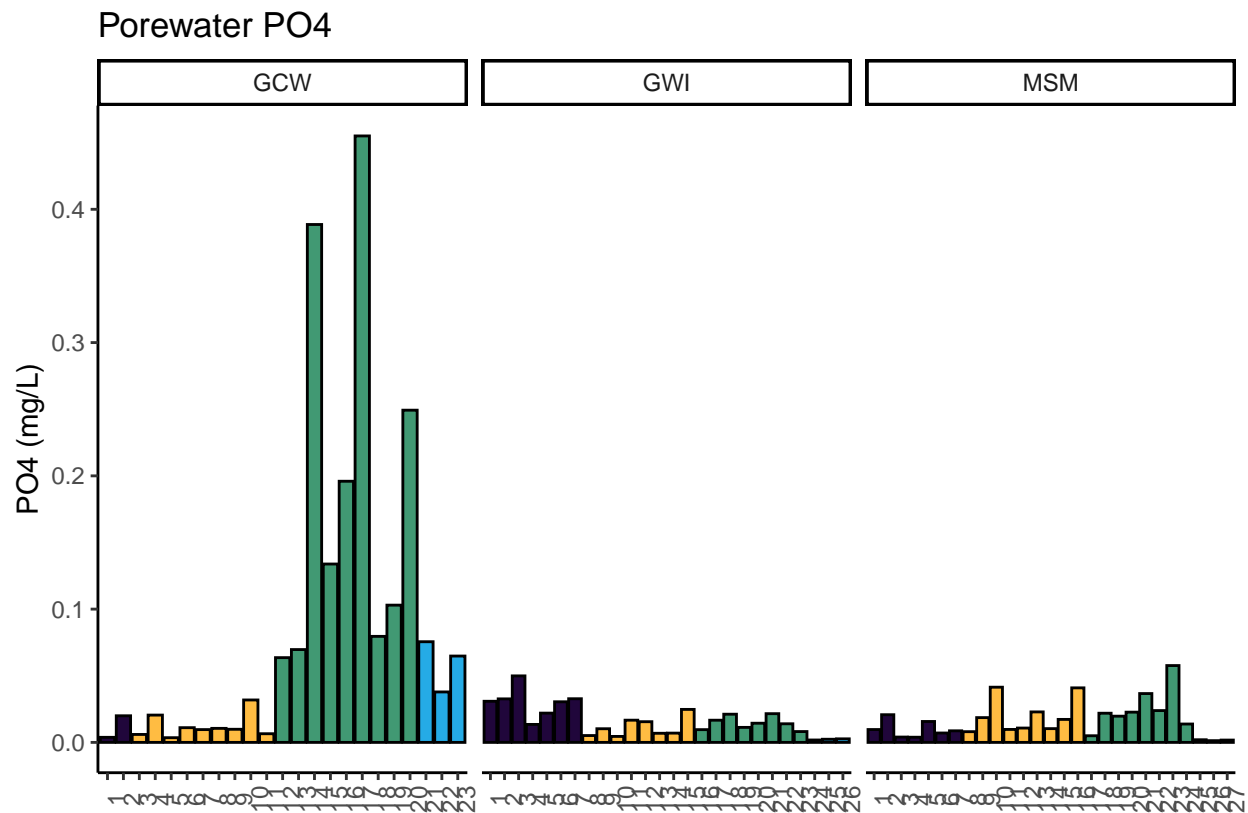
## 0.15 Visualize Data

## Visualize Data



## Porewater NH<sub>3</sub>





0.16 Export Processed Data

#end