

## **Appendix I2A**

### **CR Raw Data Source Description**

# Lower Hillsborough Continuous Recorder Master README

Southwest Florida Water Management District

2024-08-02

## Summary

This document summarizes the Continuous Recorder (CR) data that may support the Lower Hillsborough River (LHR) Recovery Strategy for the period of June 1, 1996 to December 31, 2023, as part of the Task 10 data deliverable for District TWA: 22TW0003992. This document is produced from R software code that reads in raw datasets and summarizes that key variables of interest, then combines individual files into a master dataset. Readme documentation is provided as a header paragraph for each dataset followed by summary statistics and histograms of the raw data. A line of qualifier code types is provided where present and a reported result of "character(0)" indicates no codes were available.

Where specific conductance but not salinity was provided, salinity was calculated using the equation of Schemel (2001) using the compensateR package:

$R = \text{specific\_conductance} / 53087$

$\text{Salinity} = \text{round}(0.012 + -0.2174R^{0.5} + 25.3283R + 13.7714R^{(3/2)} + -6.4788R^2 + 2.5842R^{(5/2)}, \text{digits}=2)$

Note: for some plot labels Specific Conductance is abbreviated as Spec. Conductance or Spec. Cond. in order to fit label on plot. \*\*\*

## United States Geological Service (USGS) Data

This subsection describes the individual USGS continuous recorder data files provided in the data dictionary.

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### USGS 02303000 Hillsborough River @ Zephyrhills

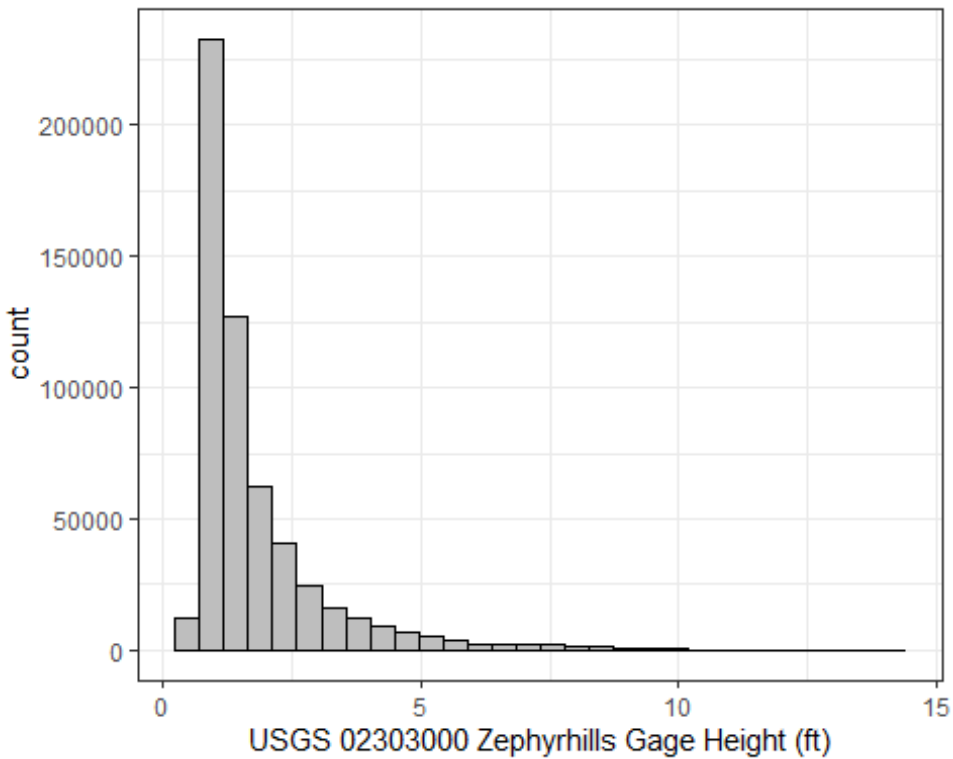
**File name and path:** /USGS/Zephyrhills/USGS\_Zephyrhills\_Continuous.xlsx

Metadata: R Script provided in tab in raw data file was run to pull the 15 minute continuous data through December 31, 2023 for Hillsborough RV at State Park NR Zephyrhills, FL - 02303000.

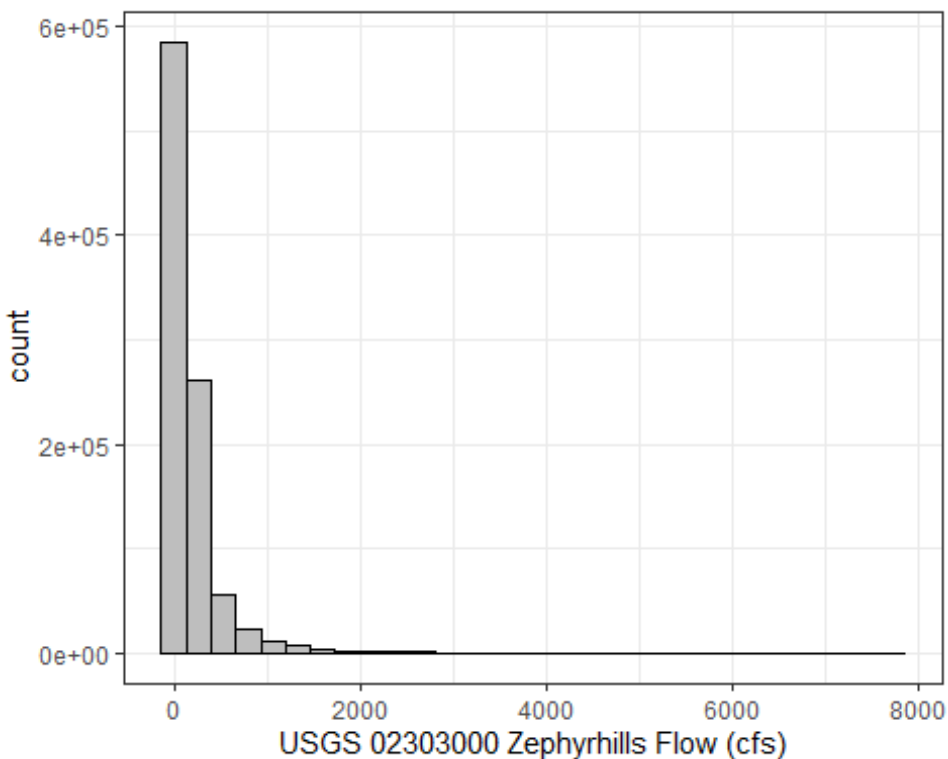
Data include flow and gage height.

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Summary statistics are summarized below based on the period of record of January 1, 1996 to December 31, 2023.



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      0.6    1.0     1.3     1.8    2.0    14.3    413000
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	26.0	75.0	107.0	218.1	204.0	7750.0	25139
##	[1] "A"	"A [91]"	"A [92]"	"A [93]"	"A e"	"A R"	"P"

### USGS 02304000 Hillsborough River @ Fowler

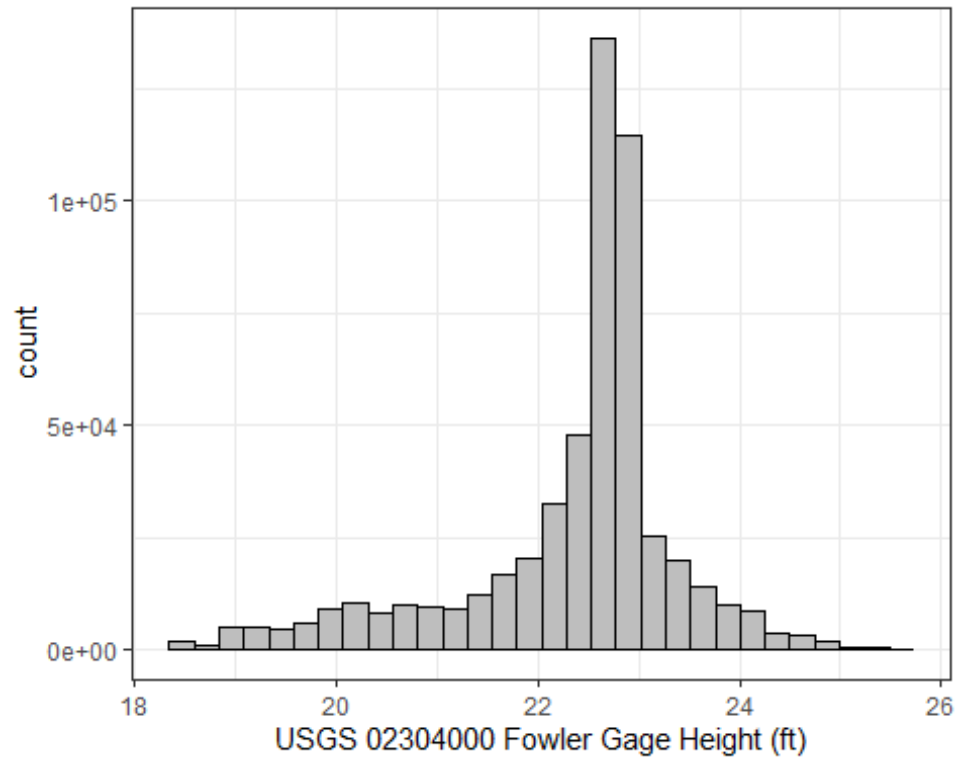
File name and path: [/USGS/Fowler/USGS\\_Fowler\\_Continuous.xlsx](#)

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Hillsborough R at Fowler AV Near Temple Terrace FL – 02304000.

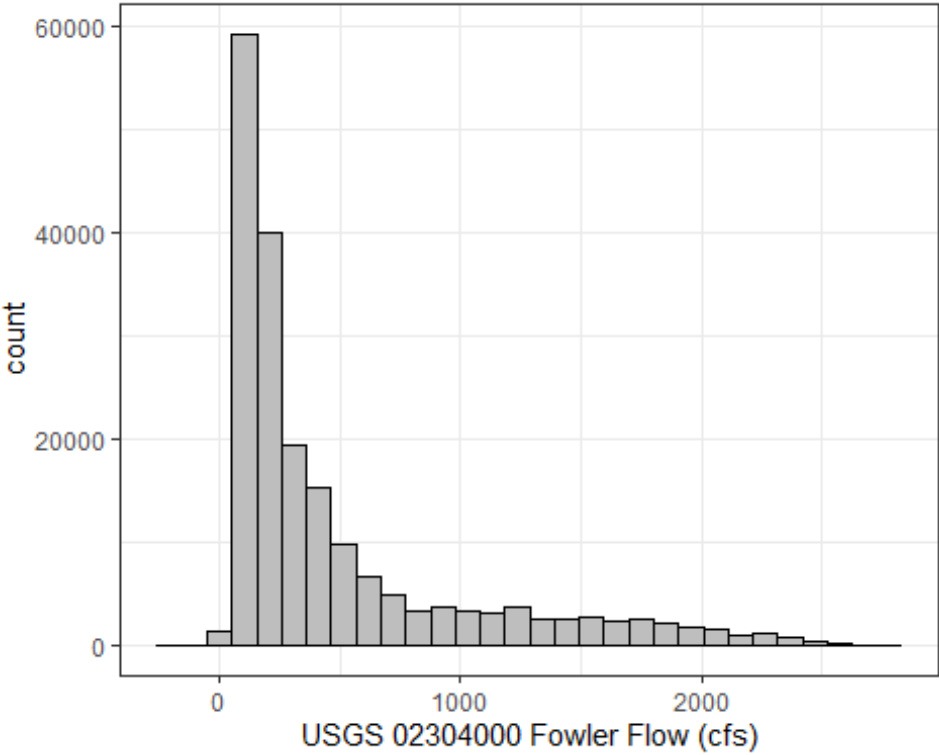
Data include temperature, gage height, flow, dissolved oxygen and specific conductance. Single level only assigned as surface reading.

Summary statistics for surface parameters are summarized below based on the period of record of June 1, 2008 to December 31, 2023.

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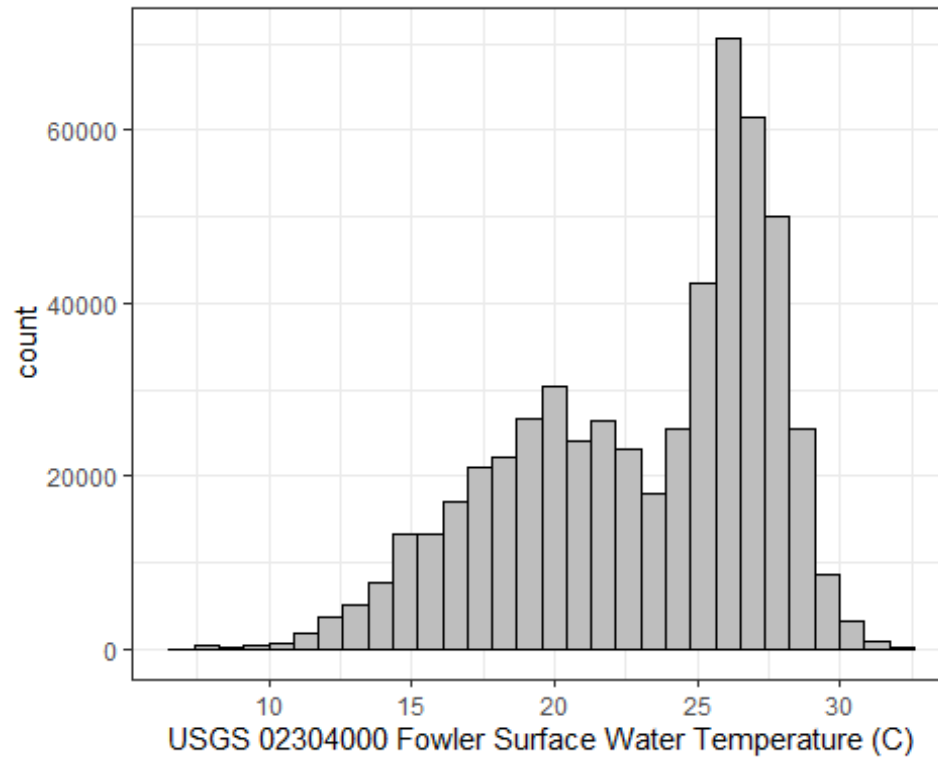


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      18.47  22.12   22.68   22.36  22.88   25.61   1128
## [1] "A" "P"
```



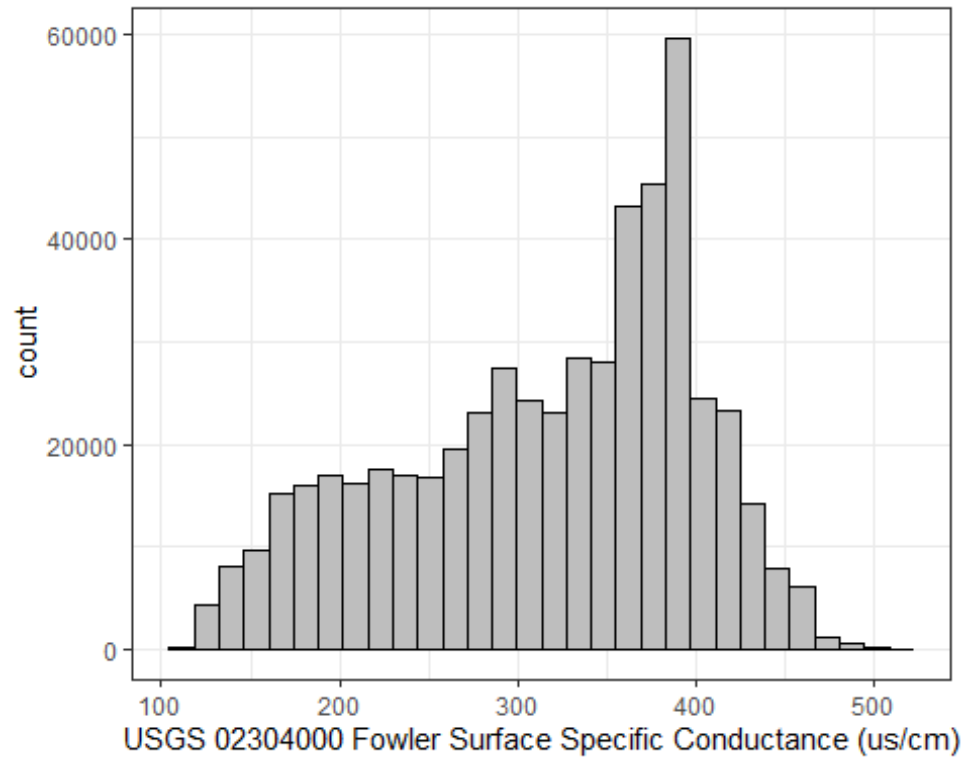
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-205.0	132.0	249.0	486.8	583.0	2780.0	351540
##	[1]	"A"	"A e"	"P"			

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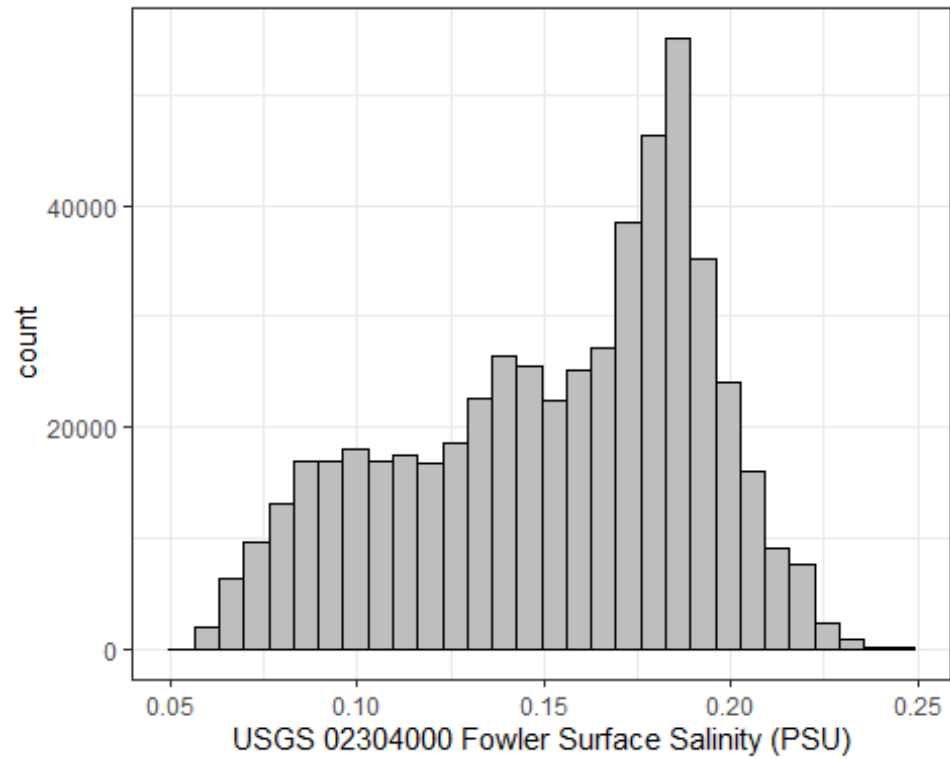


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      7.20  19.60   24.50   23.05  26.70   32.40    2714
## [1] "A" "P"
```

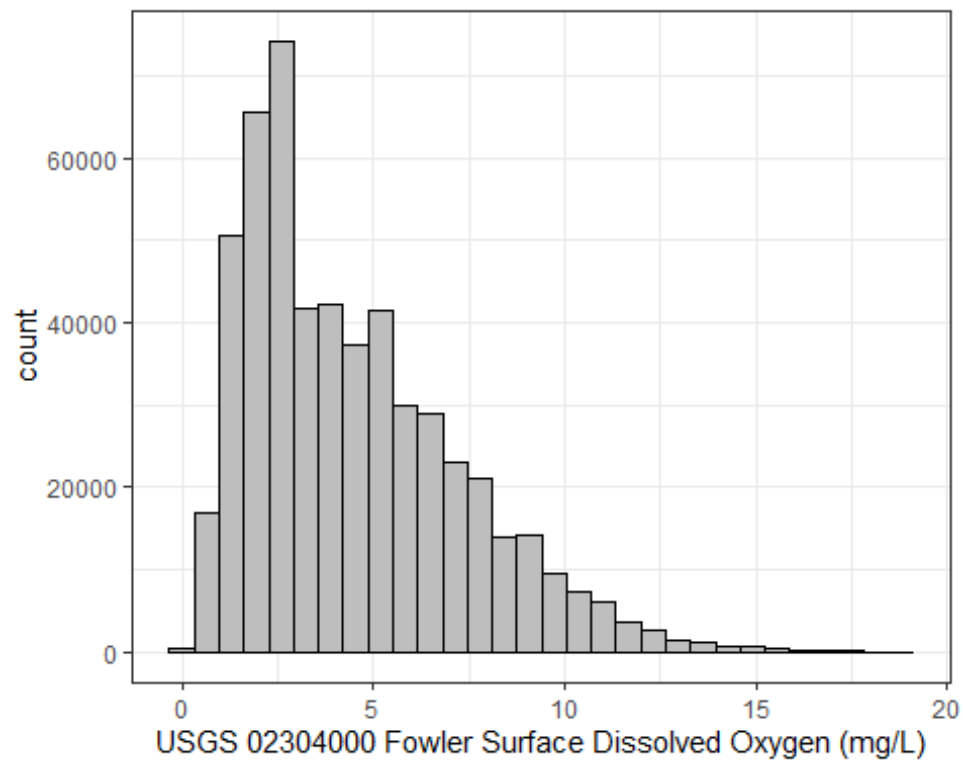
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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##    110.0   255.0   335.0   316.6   384.0   514.0    8837
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.056	0.123	0.161	0.153	0.185	0.248	8837



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's  
##    0.200   2.300   3.900   4.489   6.200   19.000   10514  
  
## [1] "A" "P"
```

---

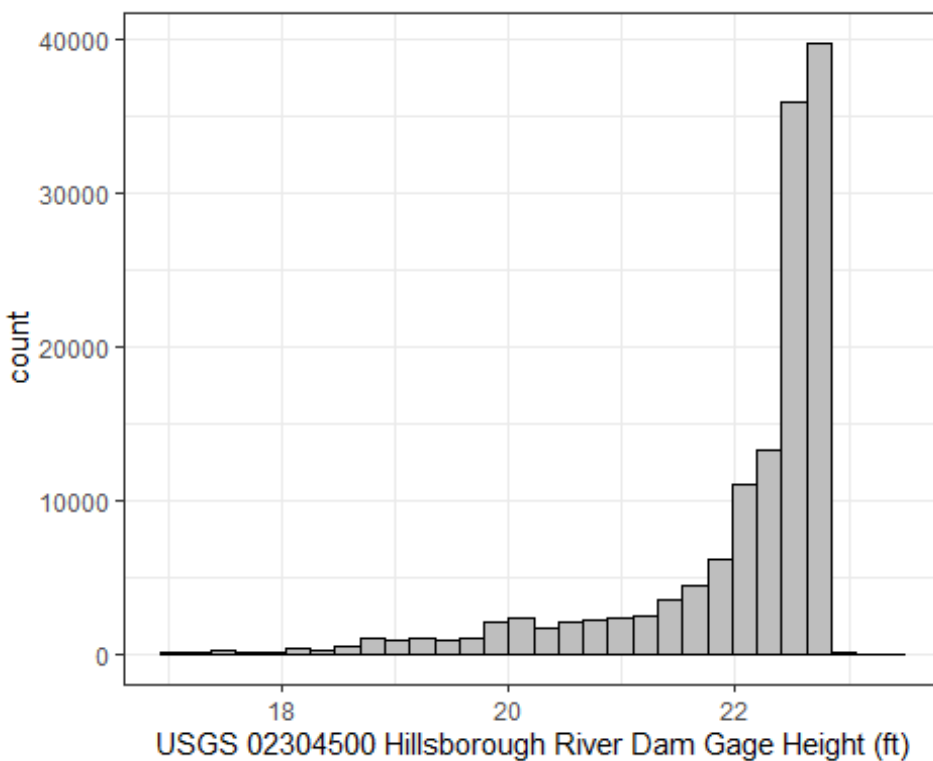
## USGS 02304500 Hillsborough River Near Tampa Dam Continuous Flows

File name and path:/USGS/Dam/USGS\_Dam\_Continuous.xlsx

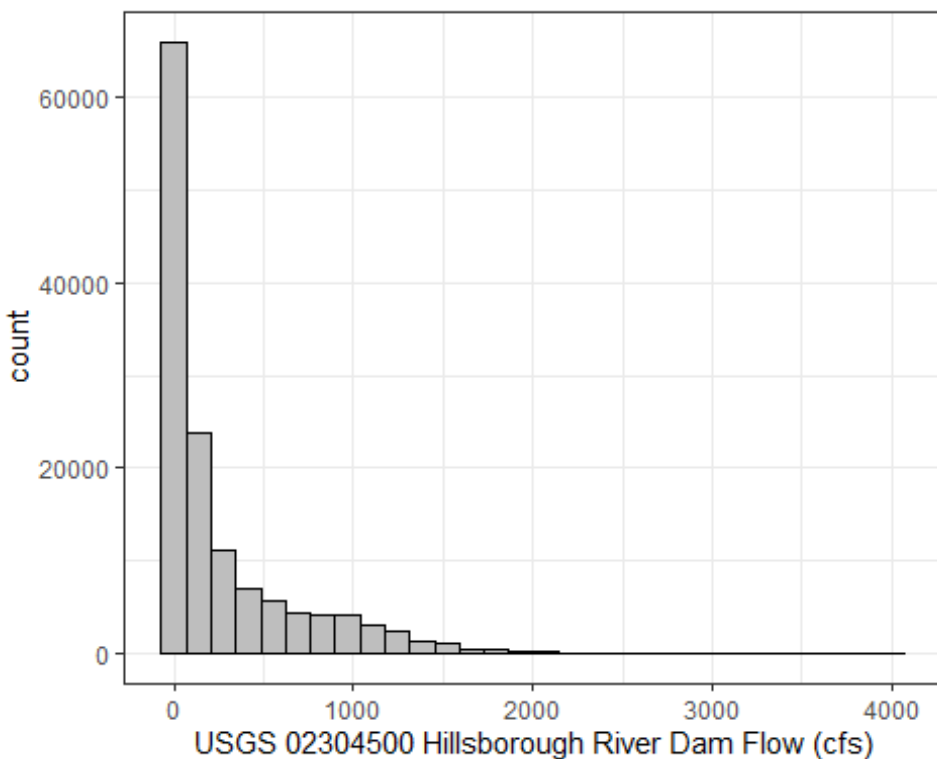
Metadata: R Script provided in tab in raw data file was used to pull the hourly continuous data through December 31, 2023 for Hillsborough River Near Tampa FL - 02304500.

Data include flow and gage height information

Summary statistics are summarized below based on the period of record of October 1, 2007 to December 31, 2023.



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's  
##    17.01   21.92   22.49   22.05   22.65   23.35     6373  
  
## [1] "A" "P"
```



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      0.0    0.0    76.0   256.2  350.0  4010.0    7566
## [1] "A" "P"
```

#### USGS 02304510 Hillsborough River @ Rowlett Park Dr.

**File name and path:** [/USGS/Rowlett/USGS\\_Rowlett\\_Continuous\\_19870711\\_20070930.csv](#)

Historical Rowlett data (1987-2007) was originally provided via email on April 15, 2024 to SWFWMD from USGS, this data is still considered provisional. The data is for Hillsborough River at Rowlett PK DR Near Tampa FL - 02304510. These data were combined with Rowlett data from 2007 through December 31, 2023 as described below.

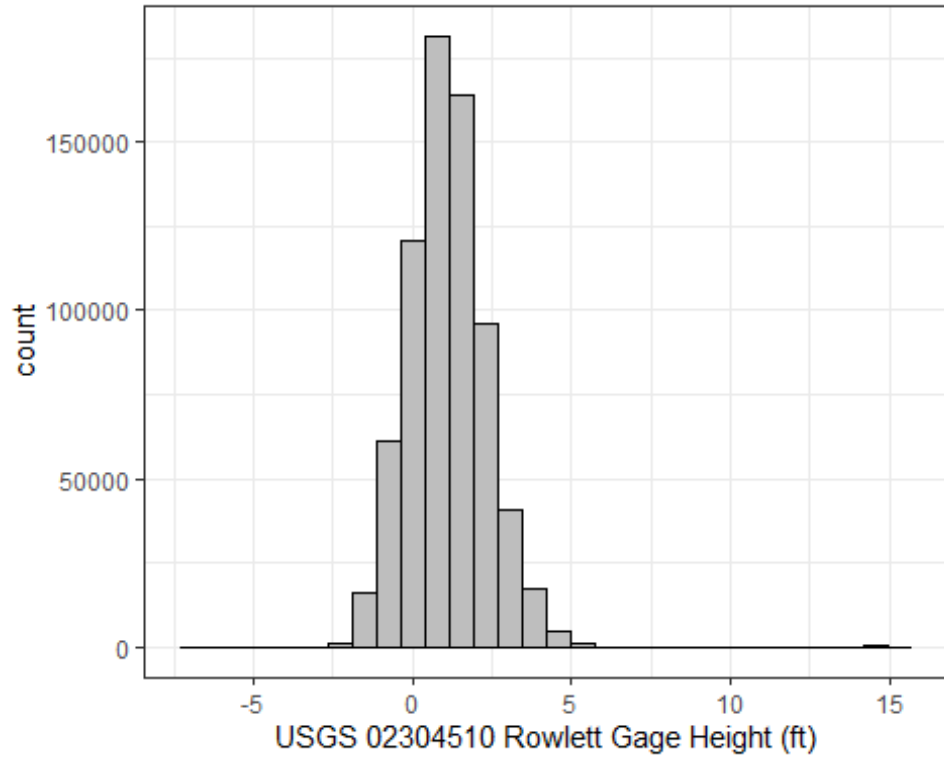
**File name and path:** [/USGS/Rowlett/USGS\\_Rowlett\\_Continuous\\_20071001\\_20231231.xlsx](#)

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Hillsborough River at Rowlett PK DR Near Tampa FL - 02304510.

Data include surface and bottom gage height, temperature and specific conductance

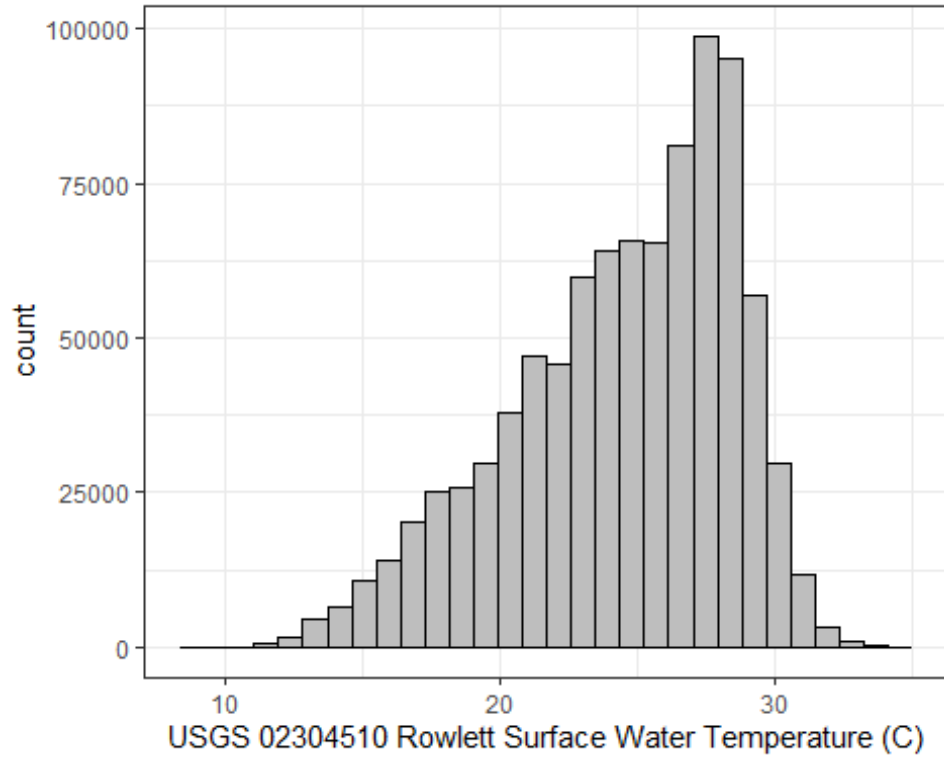
Summary statistics for surface and bottom parameters are summarized below based on the period of record of January 23, 1996 to December 31, 2023.

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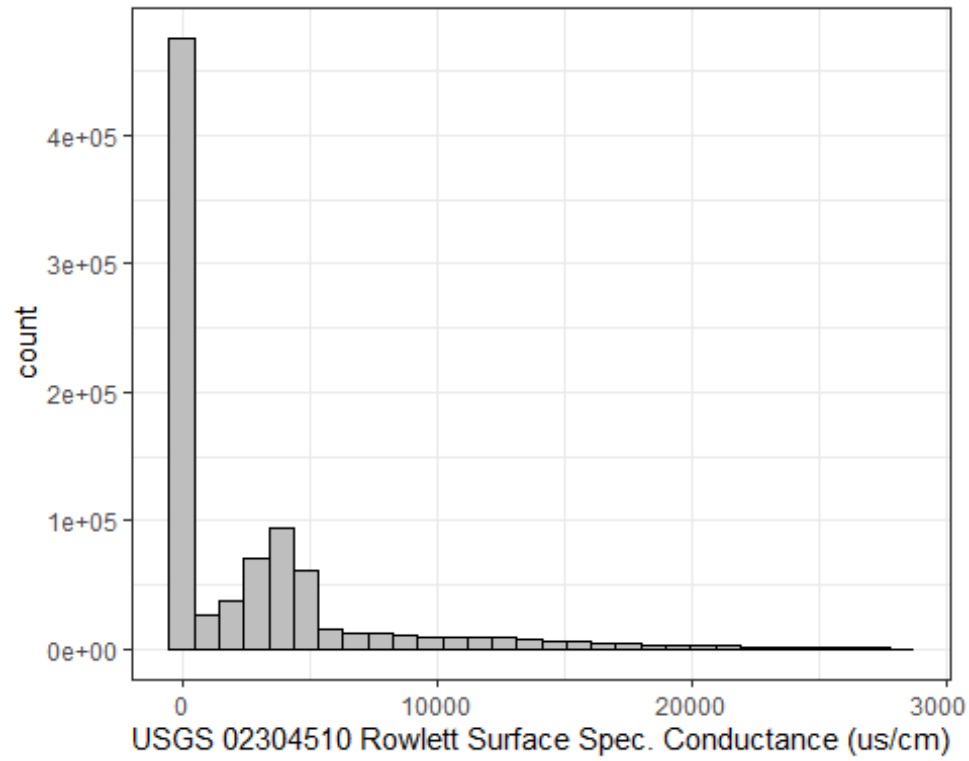
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      -7.04    0.27     1.04     1.10    1.83    15.20   274708
## [1] "A" "P"
```

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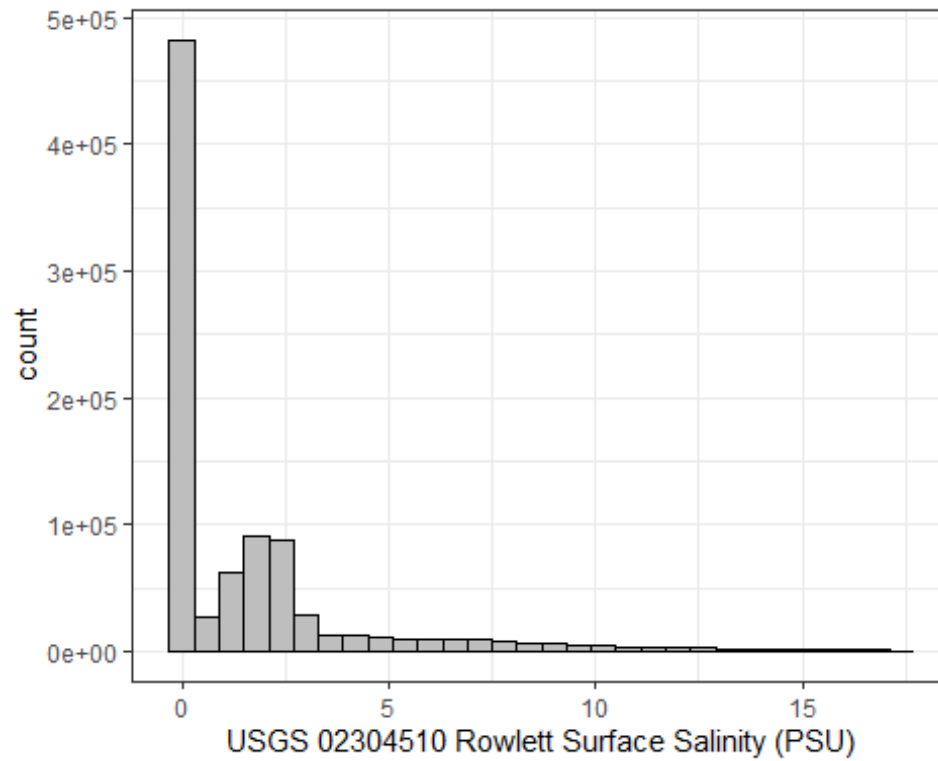


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      8.60   21.80   25.10   24.44   27.70   34.30   78908
## [1] "A" "P"
```

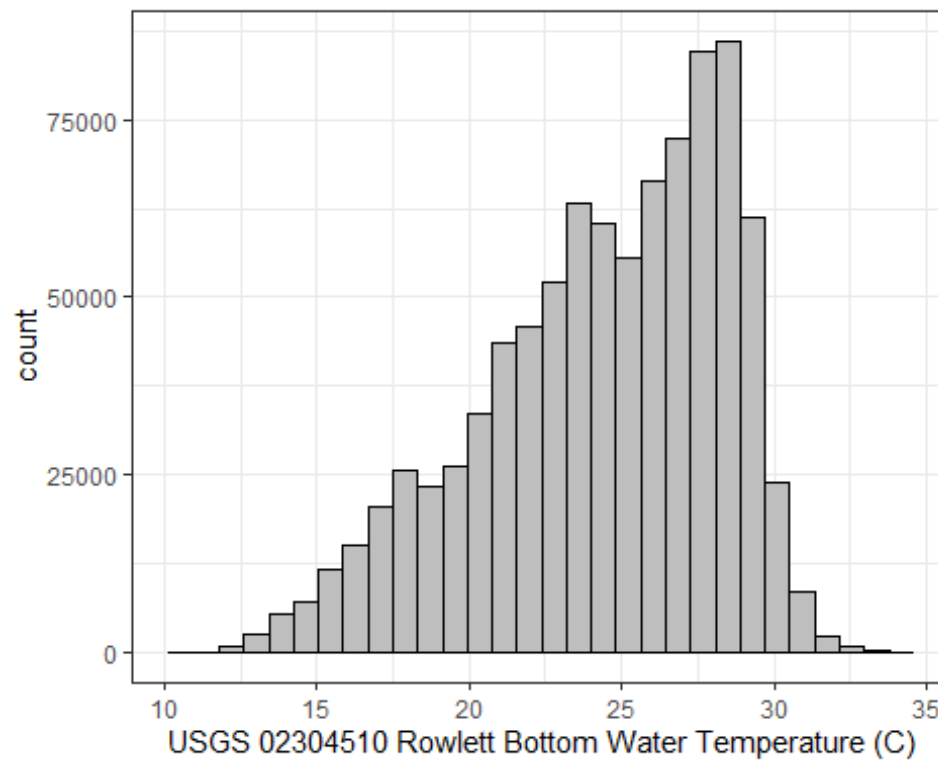
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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      82      265      382     3103    4100    28342    78698
## [1] "A" "P"
```

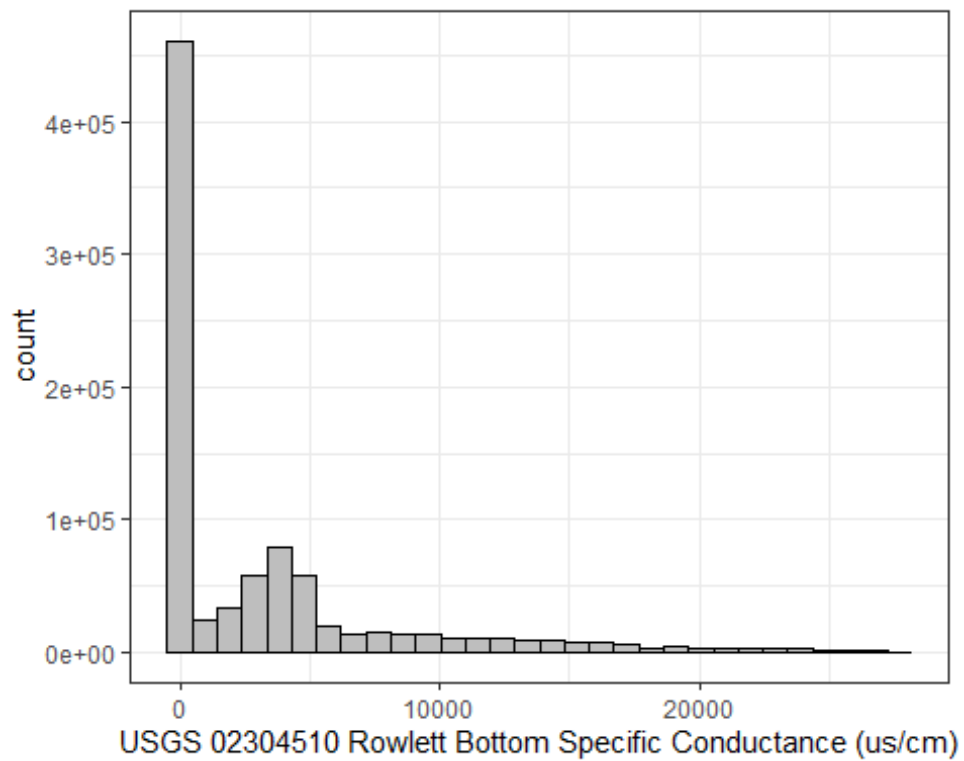


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.04	0.13	0.18	1.72	2.17	17.44	78698

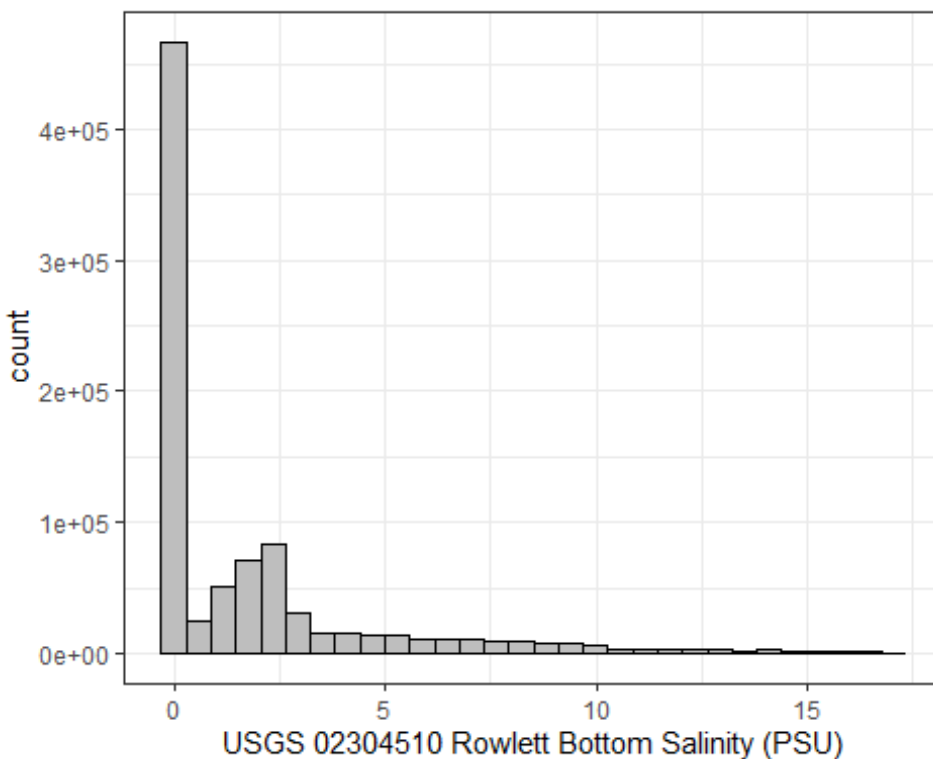


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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##    10.50  21.70   25.00   24.38  27.70   34.10   82784
## [1] "A" "P"
```



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##       88    261     383     3345    4370    27803   102503
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.05	0.13	0.18	1.86	2.32	17.08	102503

### USGS 02304517 Hillsborough River @ BLHannah

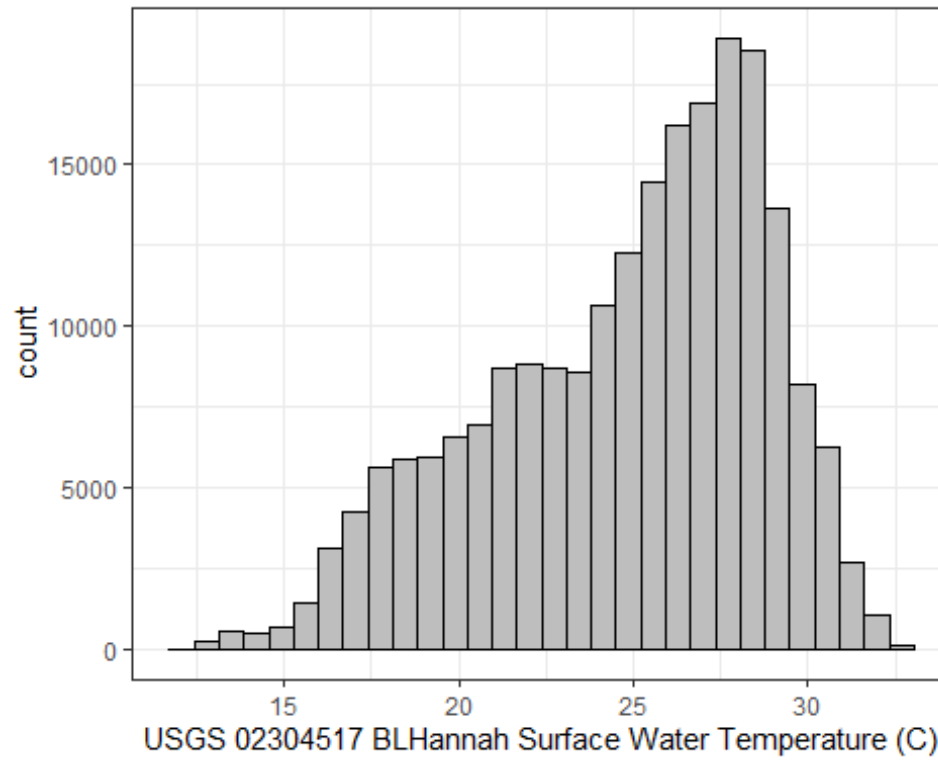
File name and path:/USGS/BLHannahs/USGS\_BLHannah\_Continuous.xlsx

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Hillsborough R BL Hannahs Whirl NR Sulphur Spgs FL – 02304517.

Data includes flow, and surface and bottom temperature, dissolved oxygen and specific conductance.

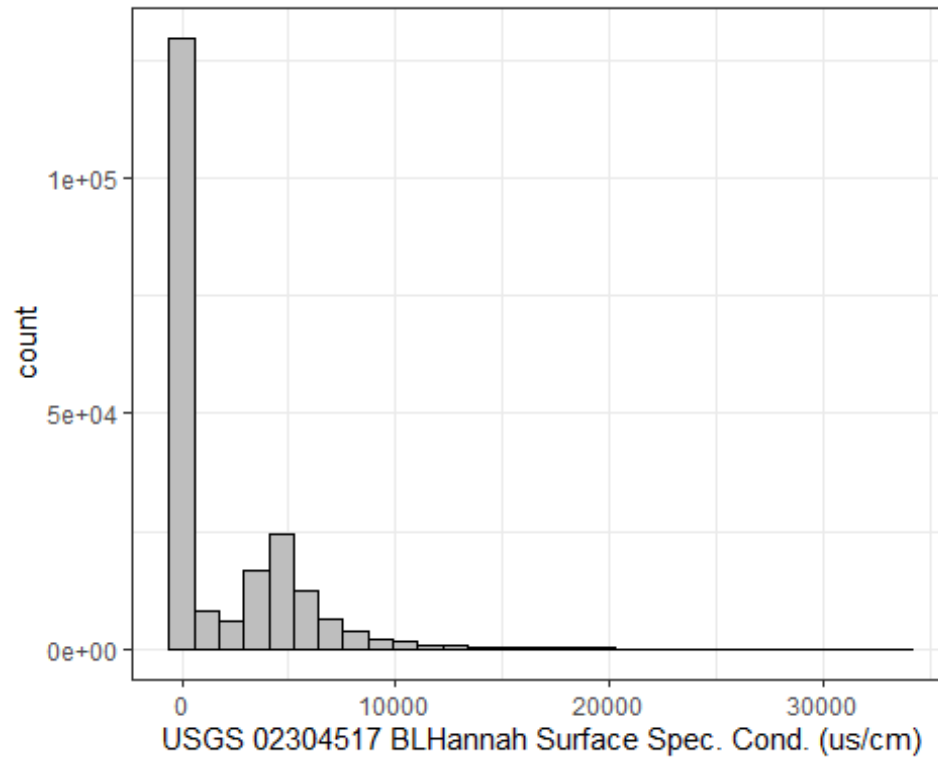
Summary statistics for surface parameters are summarized below based on the period of record of October 1, 2017 to December 31, 2023.

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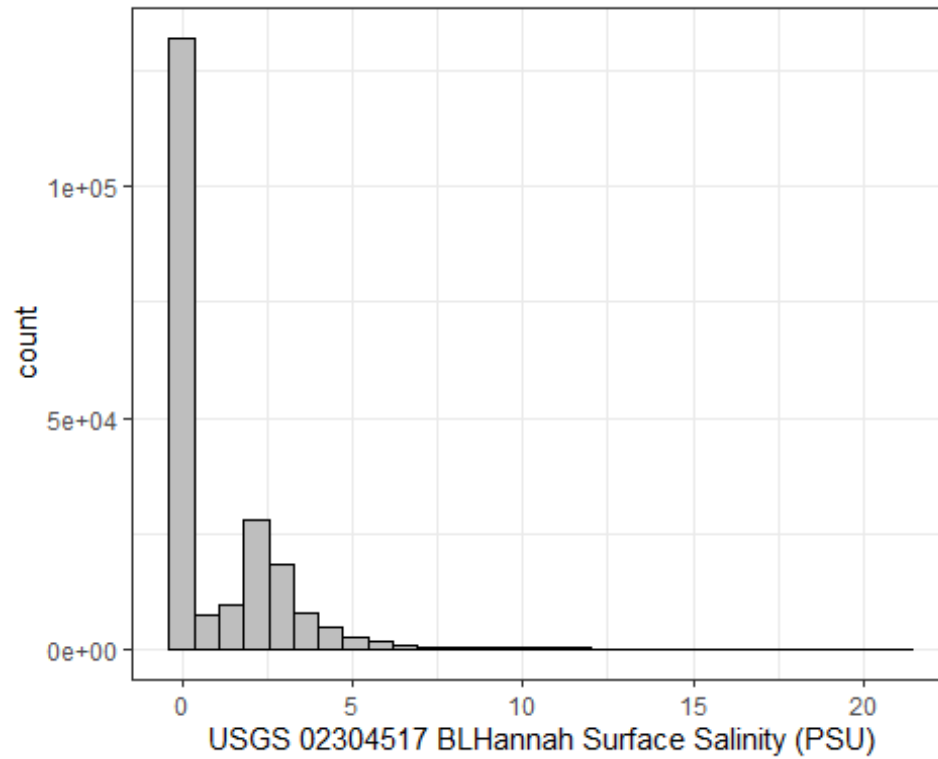


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      12.4    21.9    25.7    24.8    27.9    33.0    2732
## [1] "A" "P"
```

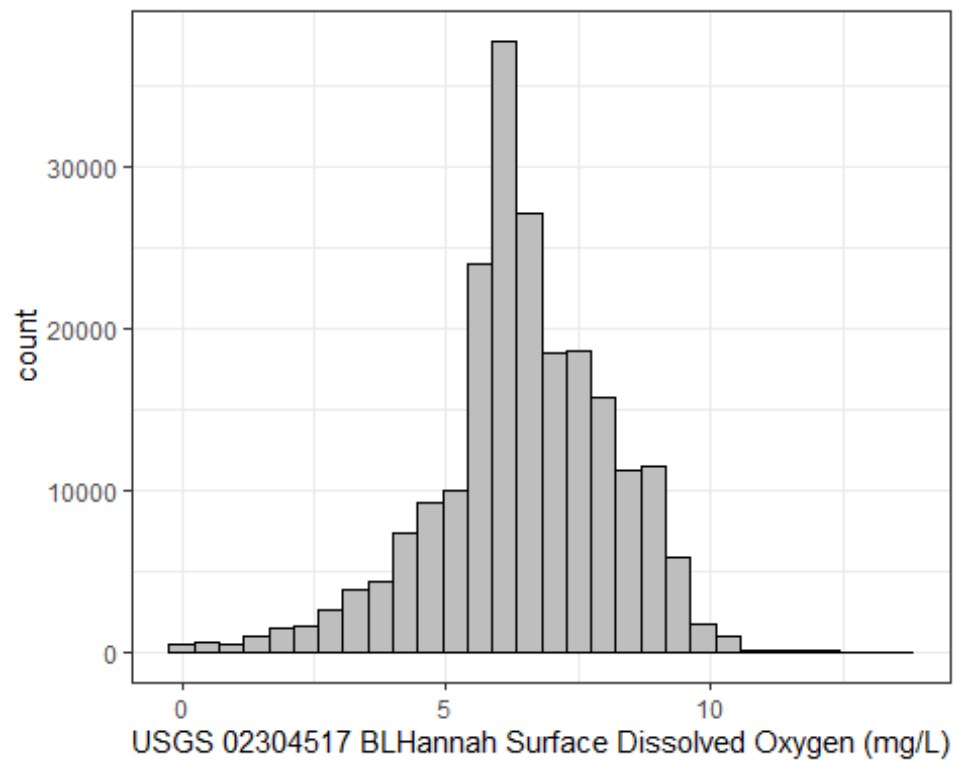
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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      115    260     339     2256    4110    33800    3124
## [1] "A" "P"
```

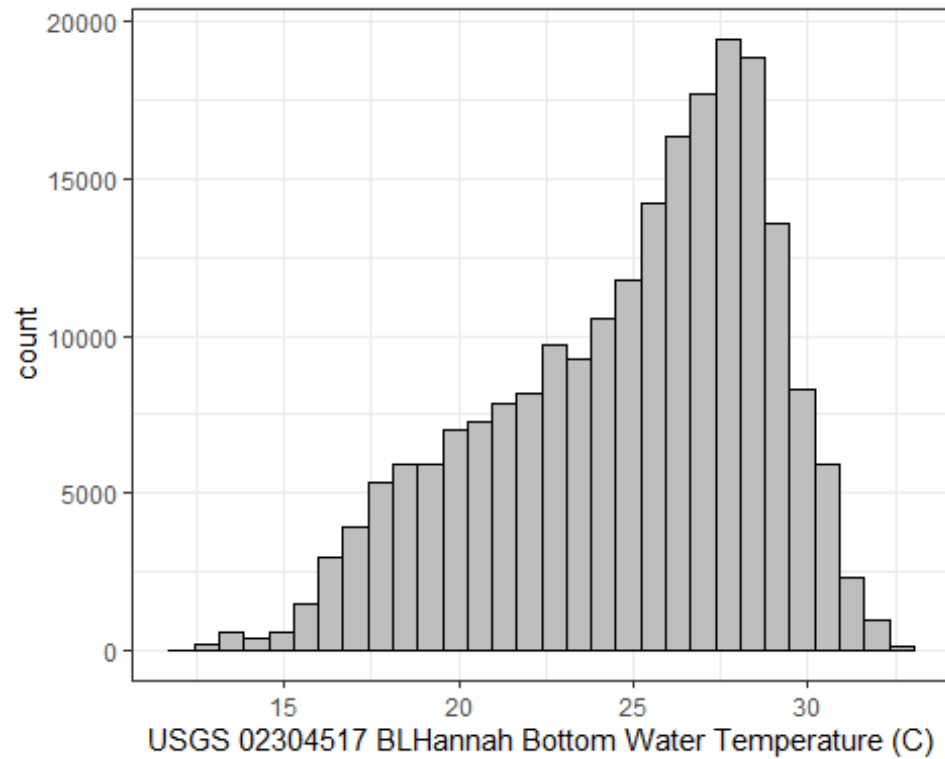


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.0581	0.1254	0.1631	1.2213	2.1746	21.1707	3124



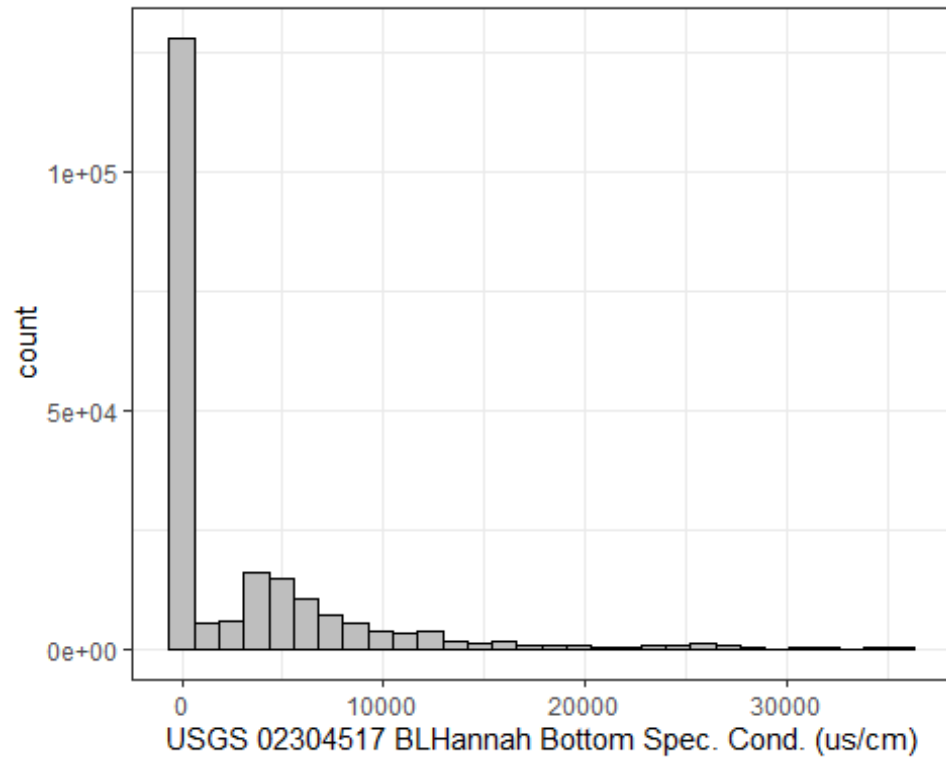
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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's  
##      0.000   5.600   6.400   6.449   7.600   13.600  2874  
  
## [1] "A" "P"
```

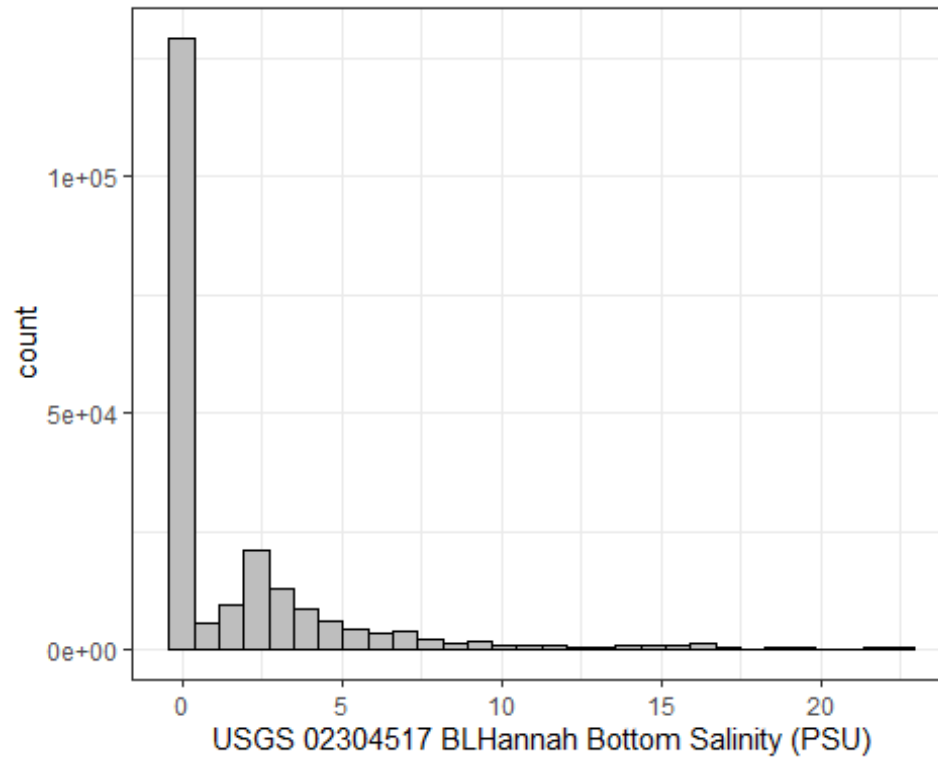


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's  
##      12.40   22.10   25.70   24.83   27.90   33.00  2556  
  
## [1] "A" "P"
```

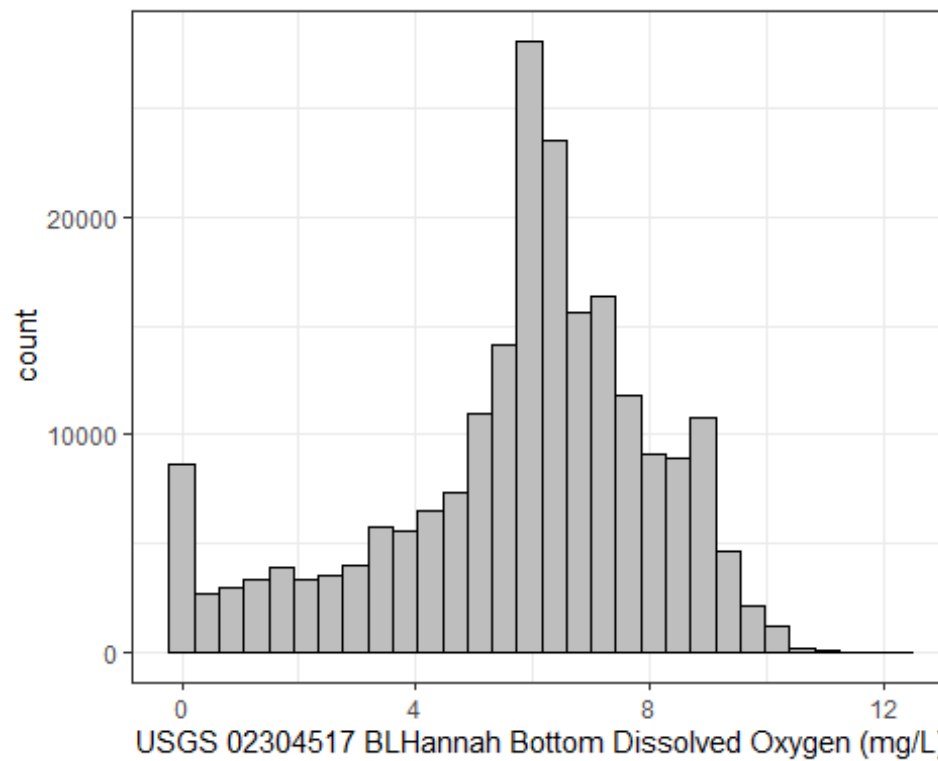
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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      94      252      336      3392    4830    35800    2649
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.0487	0.1216	0.1617	1.9100	2.5816	22.5591	2649



```
##      Min. 1st Qu.  Median      Mean 3rd Qu.      Max.      NA's  
##    0.000   4.700   6.100   5.735   7.300   12.300   4226  
  
## [1] "A" "P"
```

---

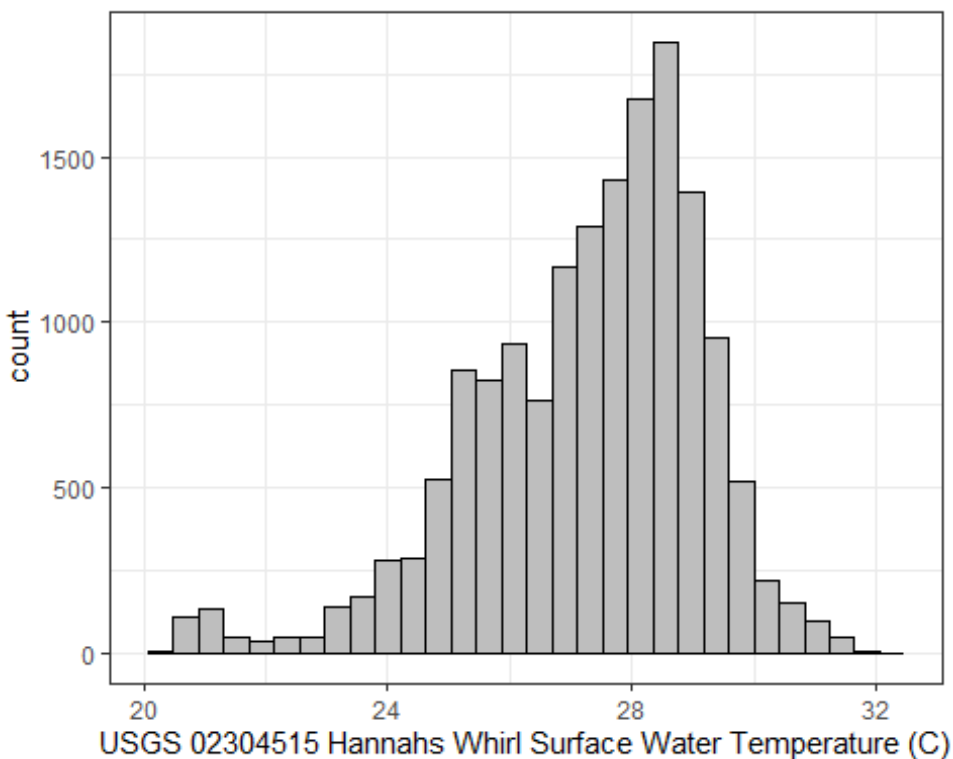
### USGS 02304515 Hillsborough River @ Hannah's Whirl

File name and path:/USGS/HannahsWhirls/USGS\_HannahsWhirl\_Continuous.xlsx

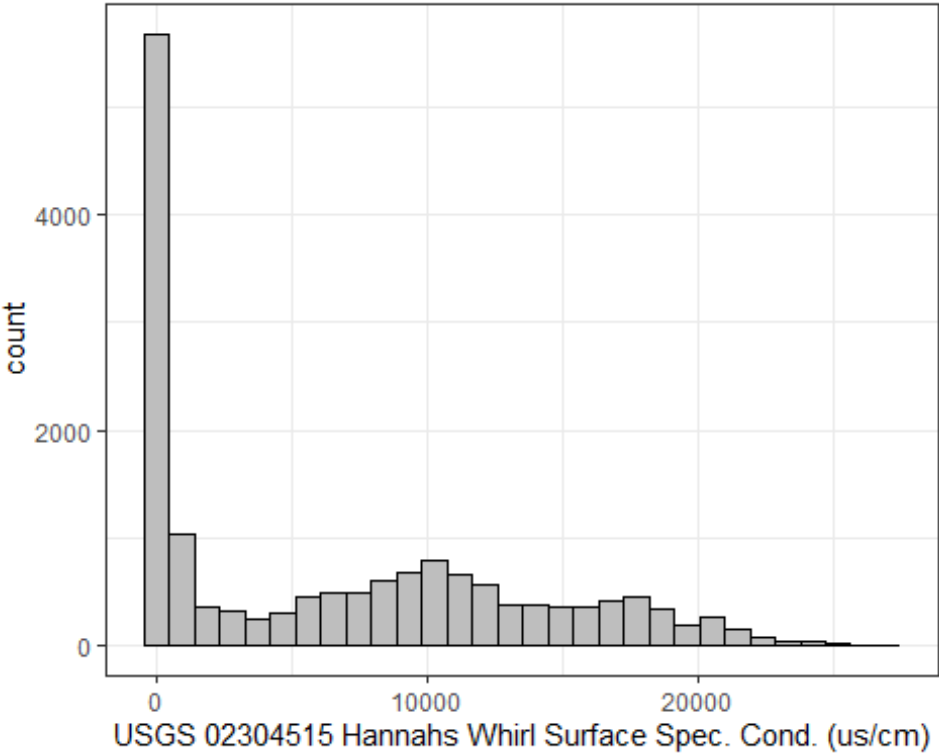
Metadata: The District provided a dataset and R Script in a tab in raw data file that was used to pull the 15 minute continuous data through December 31, 2023 for Hillsborough River @ Hannah's Whirl USGS 02304515. This file had an odd format for dattime that was corrected by converting to a csv and manually removing the "UTC" suffix from the datetime field. This csv file USGS\_HannahsWhirl\_Continuous.csv is read in by the code below

Data includes surface and bottom temperature, dissolved oxygen and specific conductance.

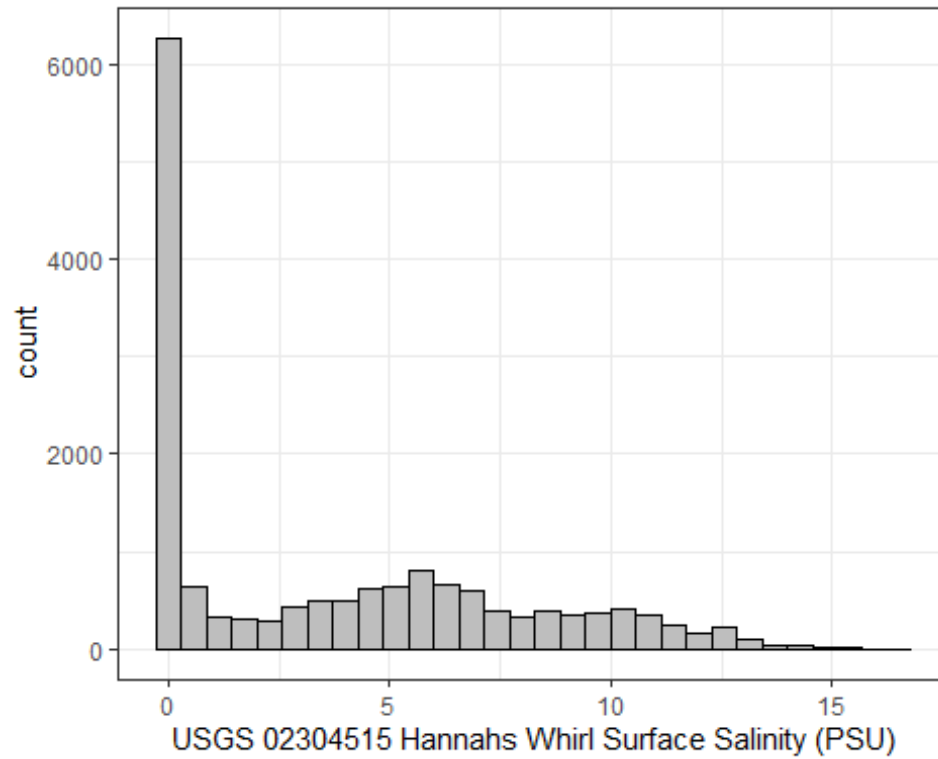
Summary statistics for surface parameters are summarized below based on the period of record of June 15, 2001 to July 01, 2002.



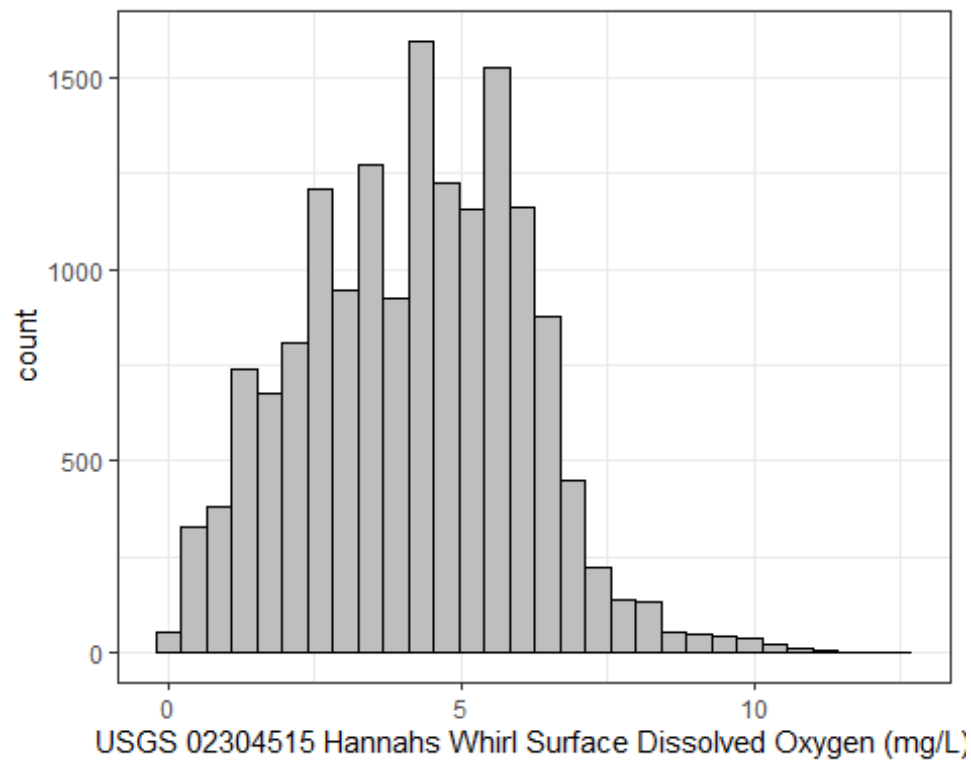
```
##      Min. 1st Qu.  Median      Mean 3rd Qu.      Max.      NA's  
##    20.30   26.10   27.70   27.27   28.60   32.30   20859  
  
## [1] " " "A"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	108	285	5318	6655	11600	27100	20842
##	[1]	" "	"A"				

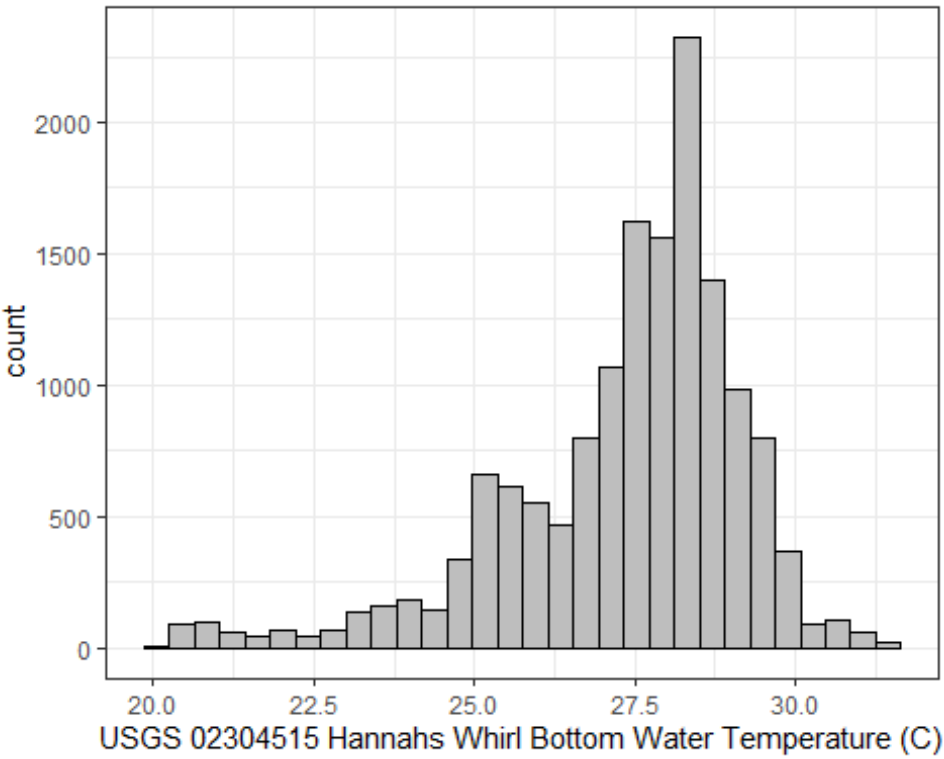


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.055	0.137	2.860	3.809	6.600	16.602	20842



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's
##  0.000   2.800   4.300   4.182   5.600  12.500  20835

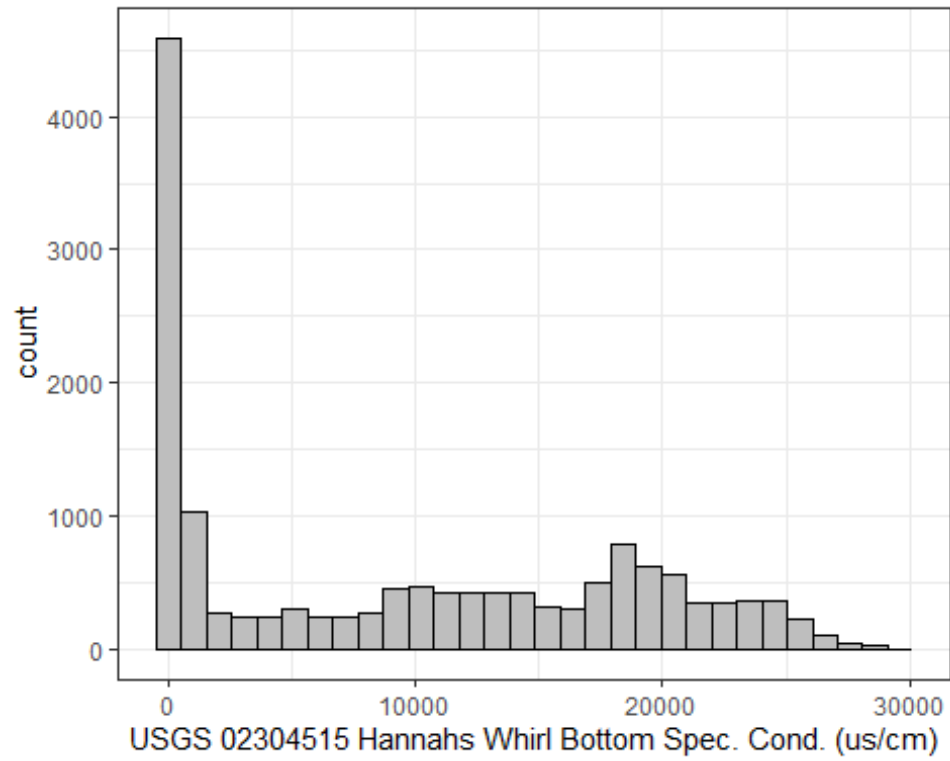
## [1] "A"
```



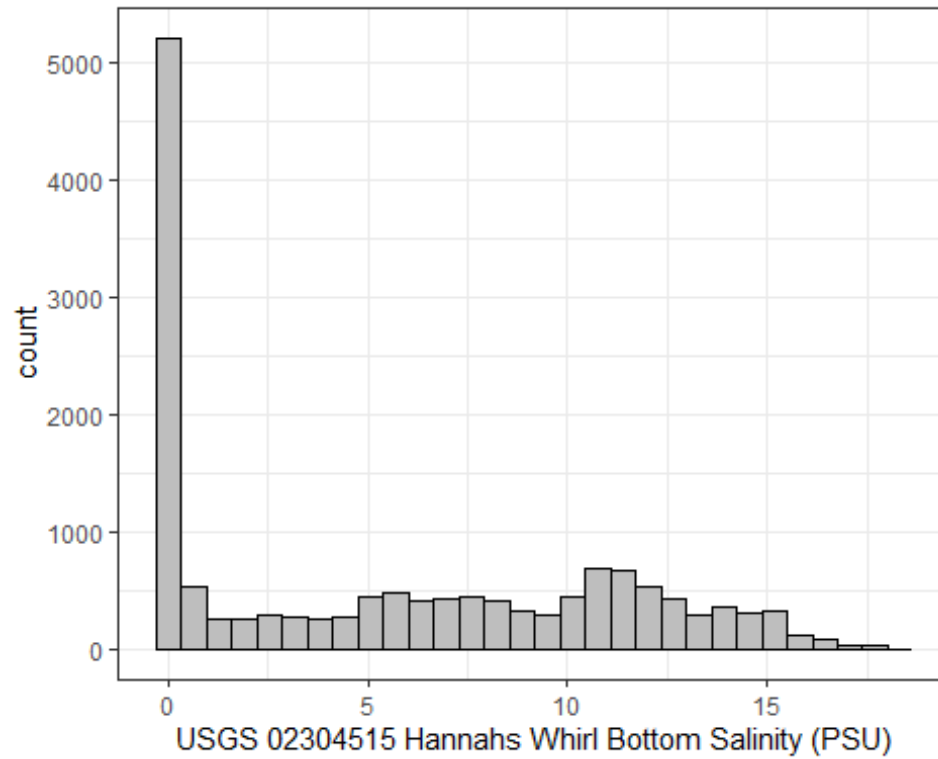
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's
##  20.20   26.50   27.80   27.36   28.60   31.60  21906

## [1] " " "A"
```

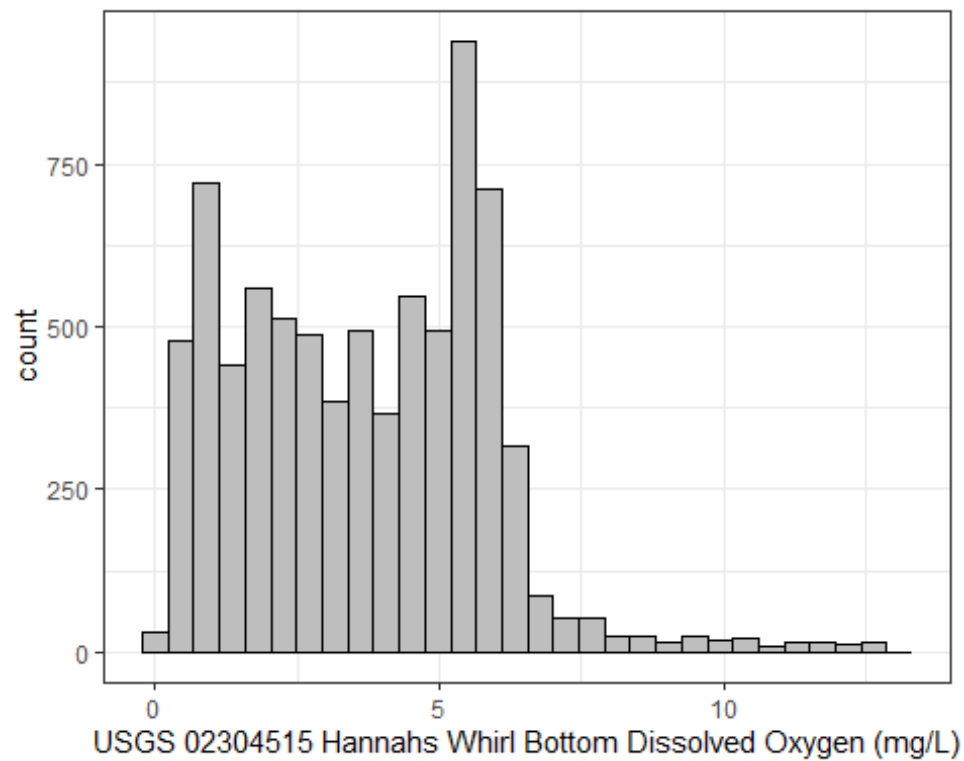
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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      170     324     8840    9477   17928   29800   21901
## [1] " " "A"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.083	0.156	4.926	5.553	10.574	18.427	21901



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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##  0.000   1.800   3.700   3.666   5.400   13.100   28994
## [1] " " "A"
```

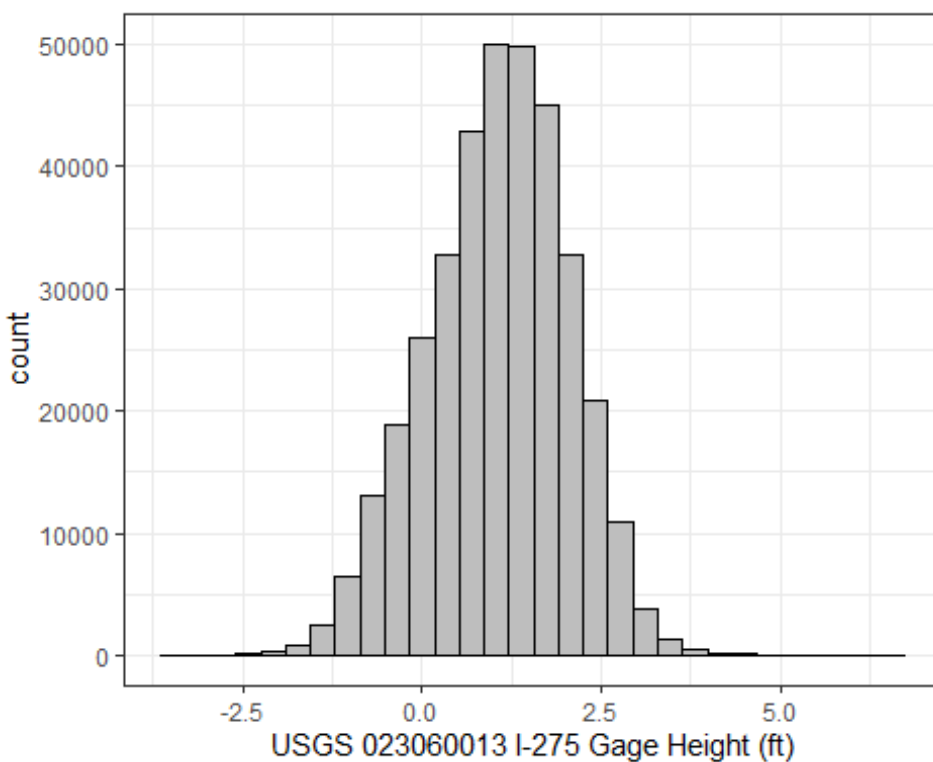
### USGS 023060013 Hillsborough R. at I-275 Bridge at Sulphur Springs FL.

File name and path:/USGS/I275/USGS\_I275\_Continuous.xlsx

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Hillsborough R. at I-275 Bridge at Sulphur Spgs FL - 023060013.

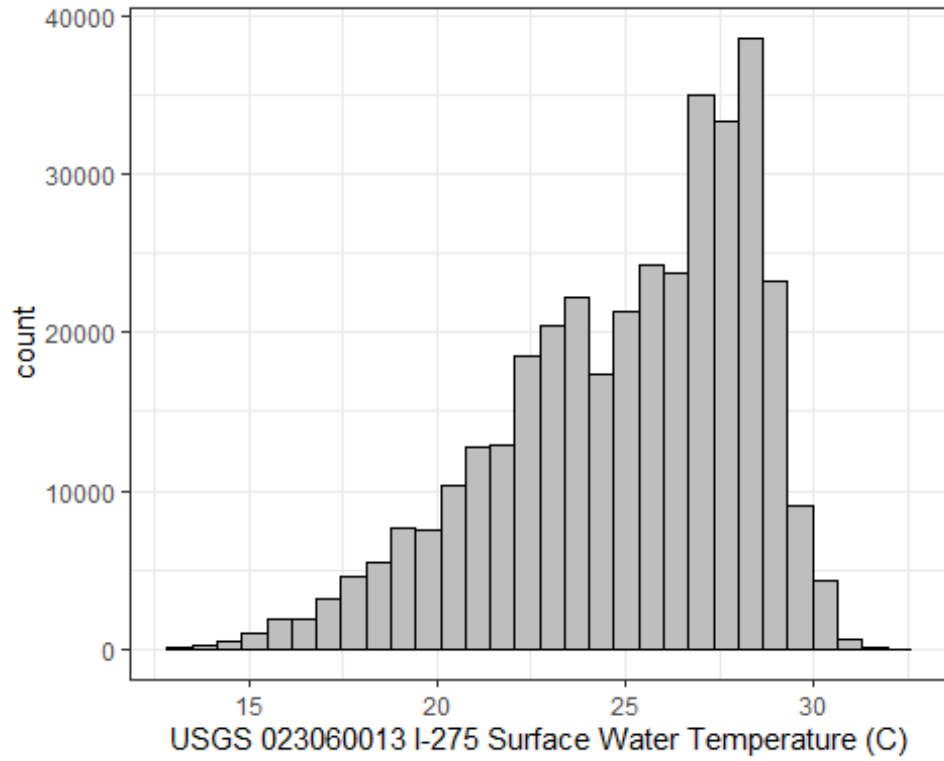
Data include gage height and surface and bottom temperature and specific conductance.

Summary statistics for surface parameters are summarized below based on the period of record of June 30, 2011 to December 31, 2023



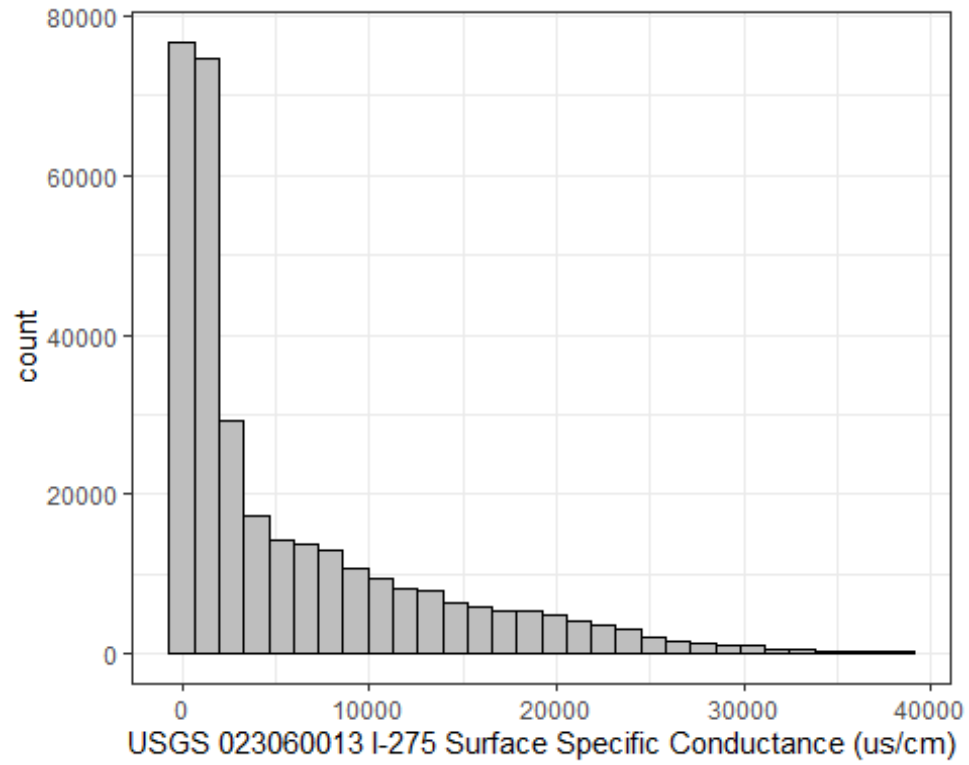
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
## -3.38   0.41   1.12   1.06   1.74   6.66   79640
## [1] "A" "P"
```

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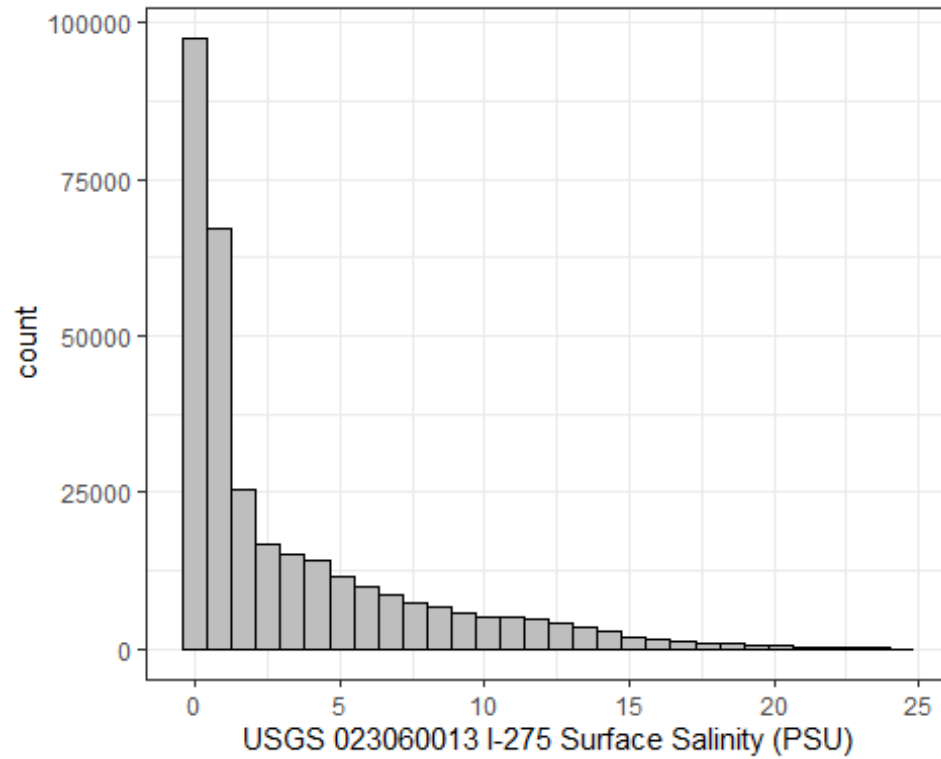


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's
##      13.00   22.80   25.70   24.99   27.70   32.10  76747
## [1] "A" "P"
```

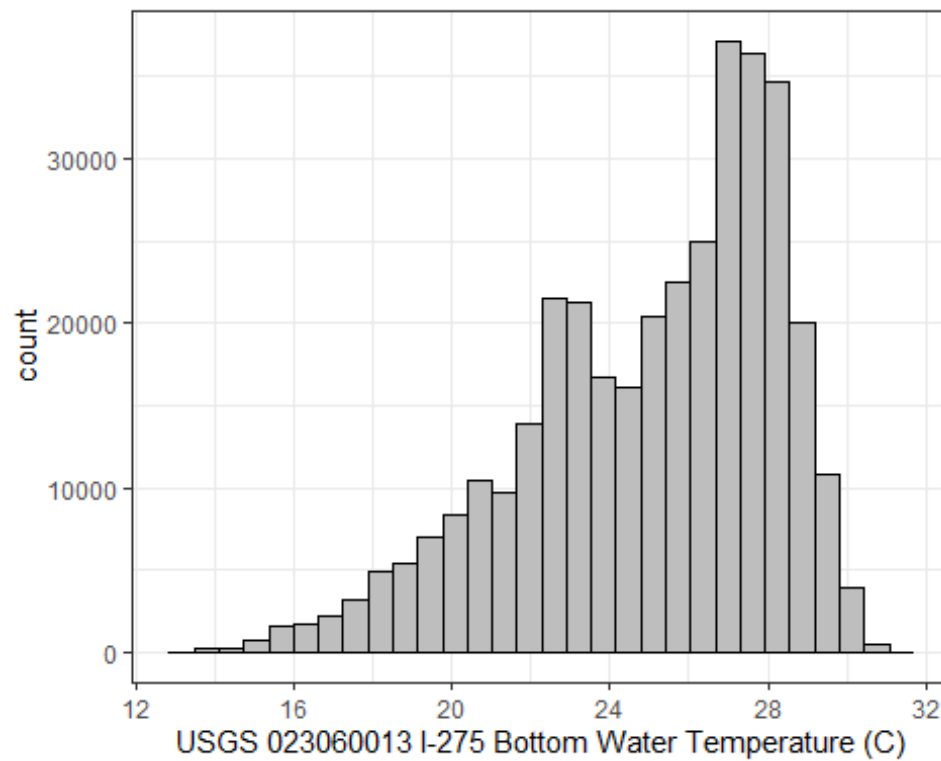
**DRAFT**



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      171     690     2290     5831     8840    38600    117943
## [1] "A" "P"
```

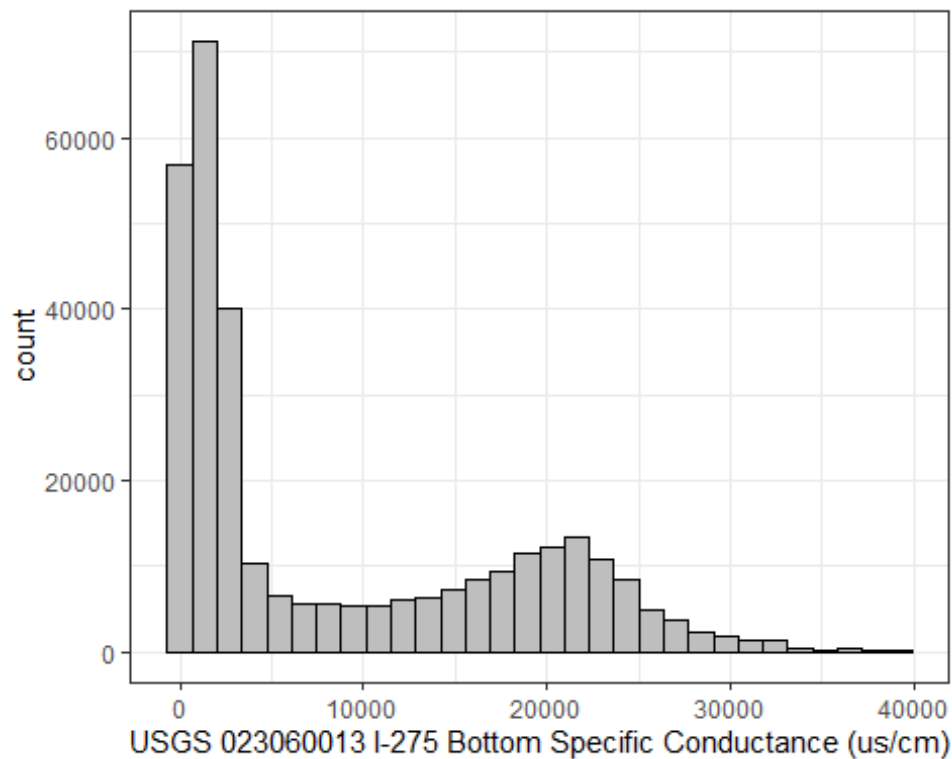


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.08	0.34	1.17	3.33	4.93	24.52	117943

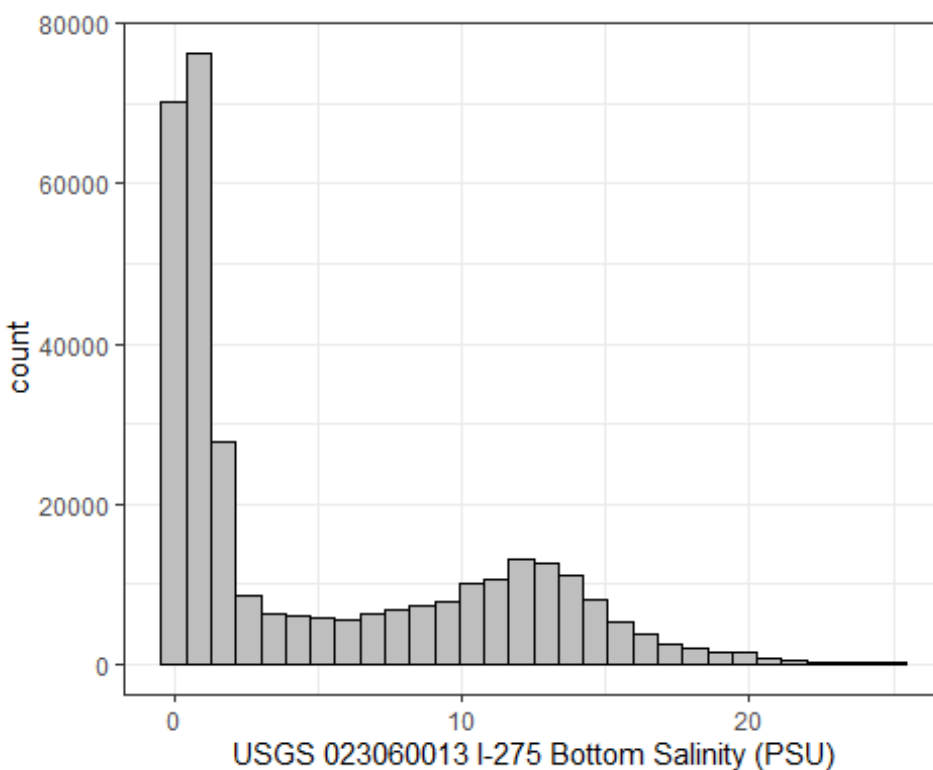


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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##    13.20  22.90   25.80   25.04  27.60   31.40   82143
## [1] "A" "P"
```



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      183   1010    2910    8701   17500   39400   120131
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.09	0.50	1.51	5.10	10.30	25.09	120131

### USGS 02306028 Hillsborough River @ Platt Street

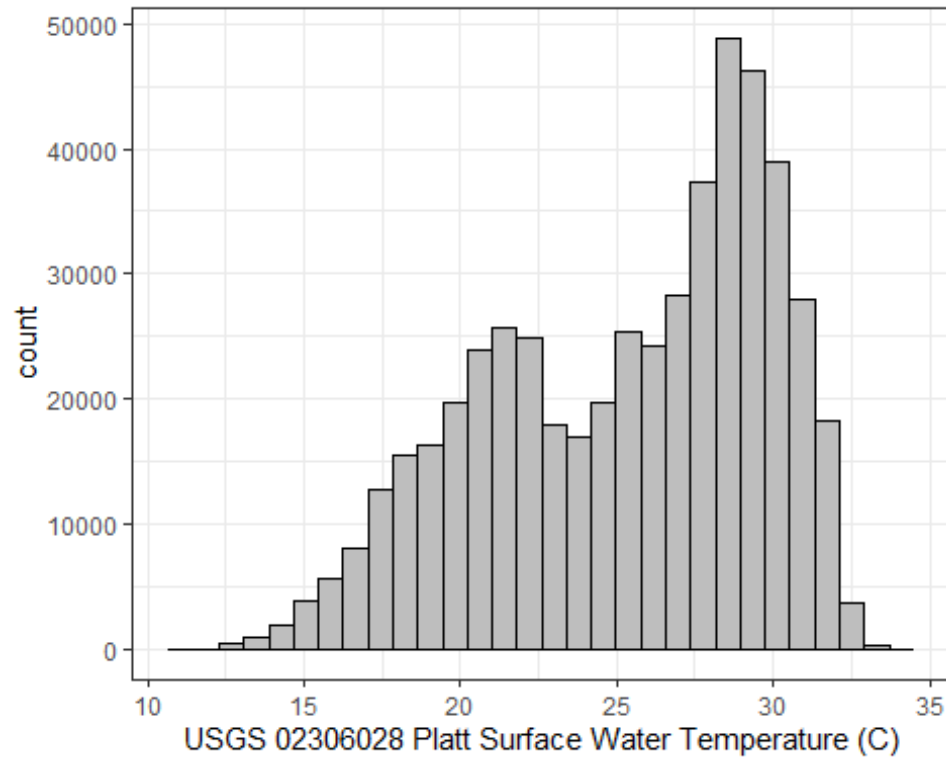
File name and path: [/USGS/Platt/USGS\\_Platt\\_Continuous.xlsx](#)

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Hillsborough River at Platt Street at Tampa FL - 02306028.

Data include surface and bottom temperature and specific conductance

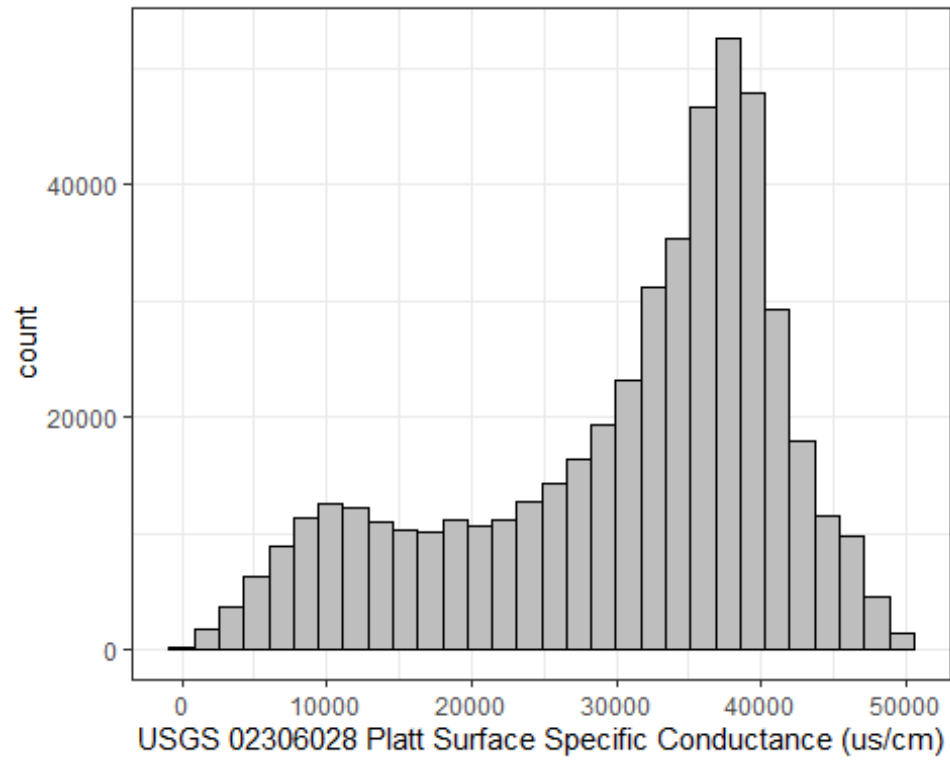
Summary statistics for surface parameters are summarized below based on the period of record of June 1, 2008 to December 31, 2023

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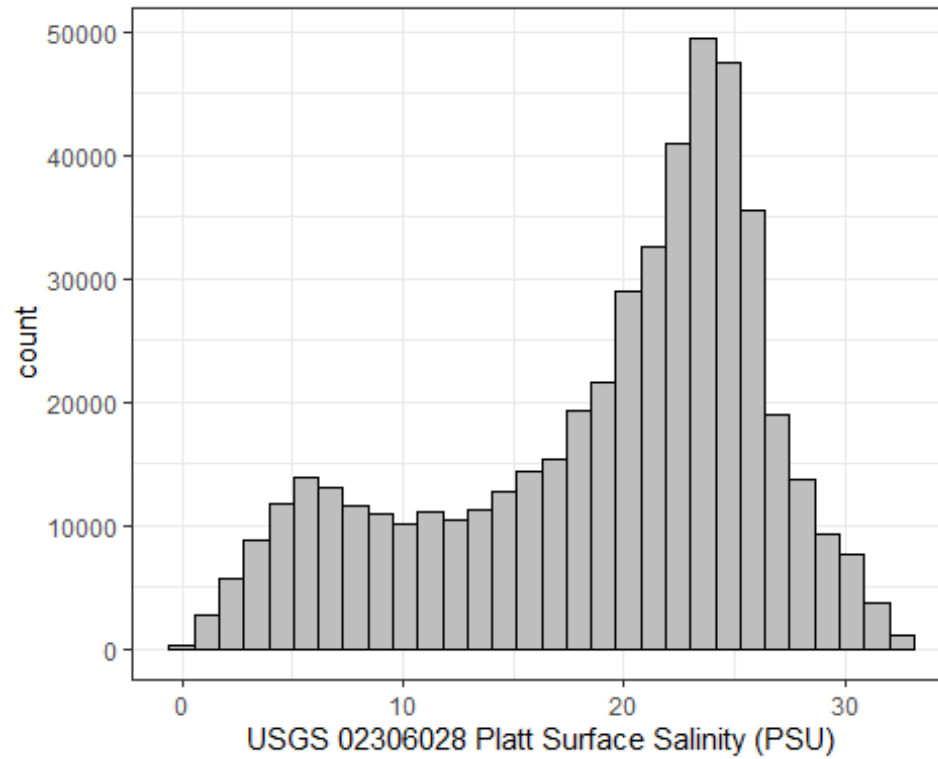
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##    11.30   21.70   26.30   25.33   29.10   34.30   32507
## [1] "A" "P"
```

**DRAFT**

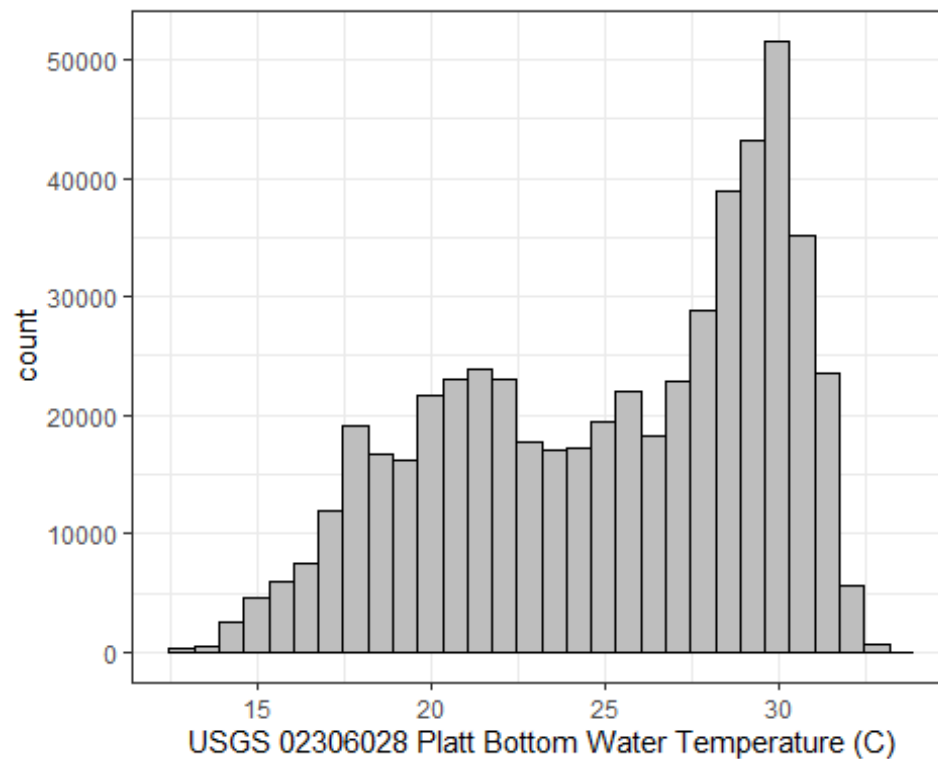


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      220   23500   33900   30362   38500   49900   51447
## [1] "A" "P"
```

**DRAFT**

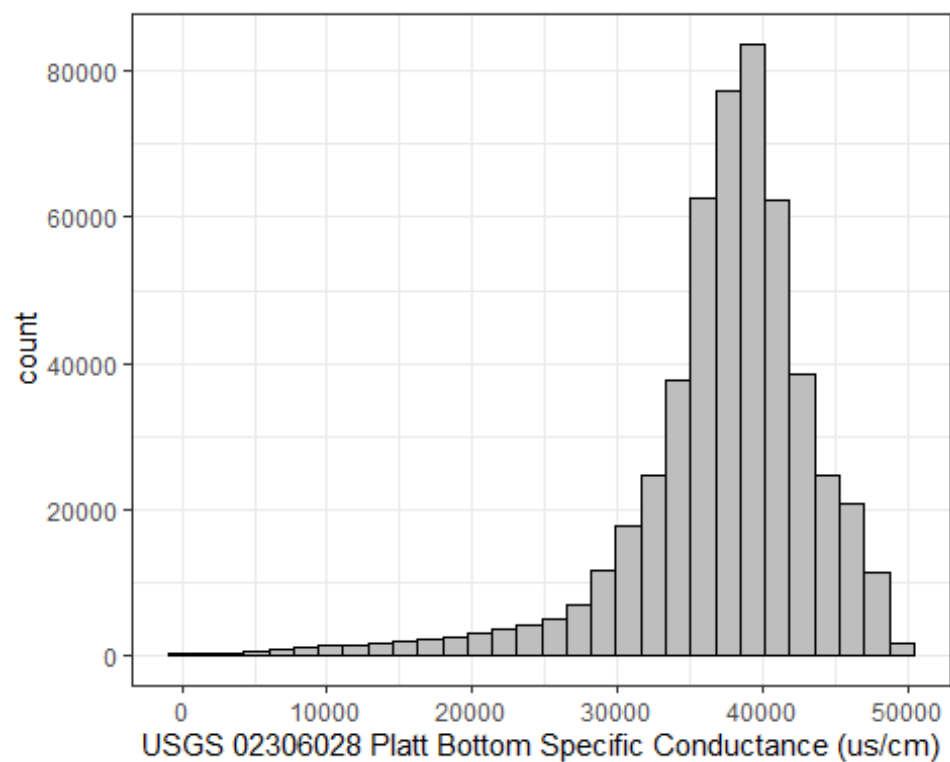


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.11	14.20	21.24	19.00	24.45	32.65	51447

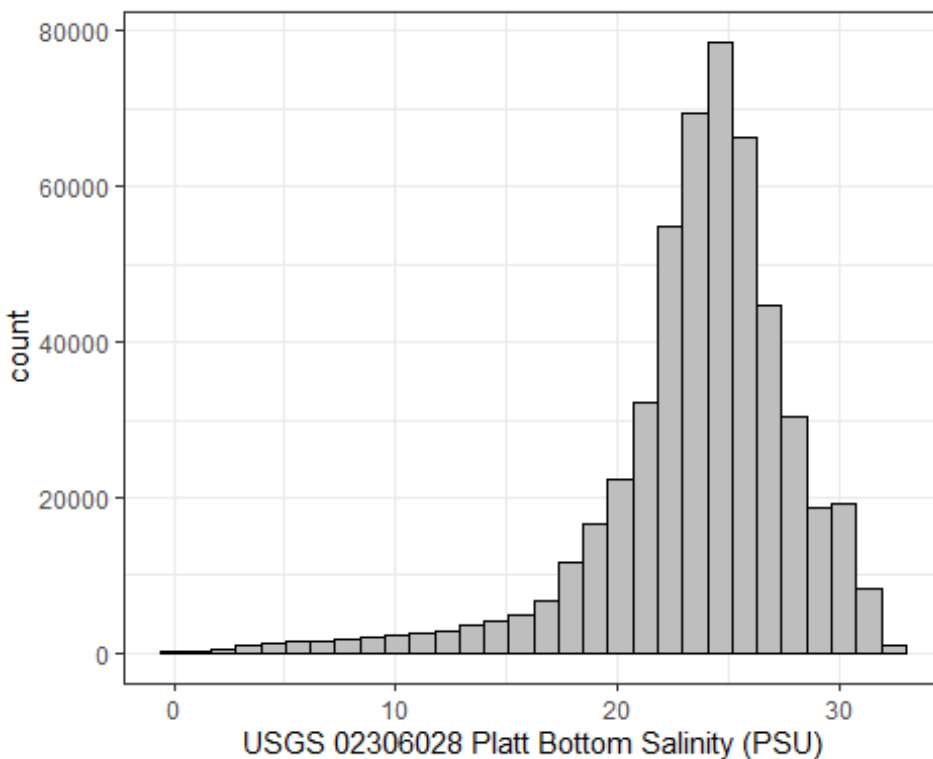


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```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's  
##    12.80  21.20   26.00   25.15  29.40   33.50   7586  
  
## [1] "A" "P"
```



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   NA's  
##      275   35000   38200   37228   40900   49800   35090  
  
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.13	22.00	24.24	23.62	26.15	32.58	35090

### USGS 02306000 Sulphur Springs Pool

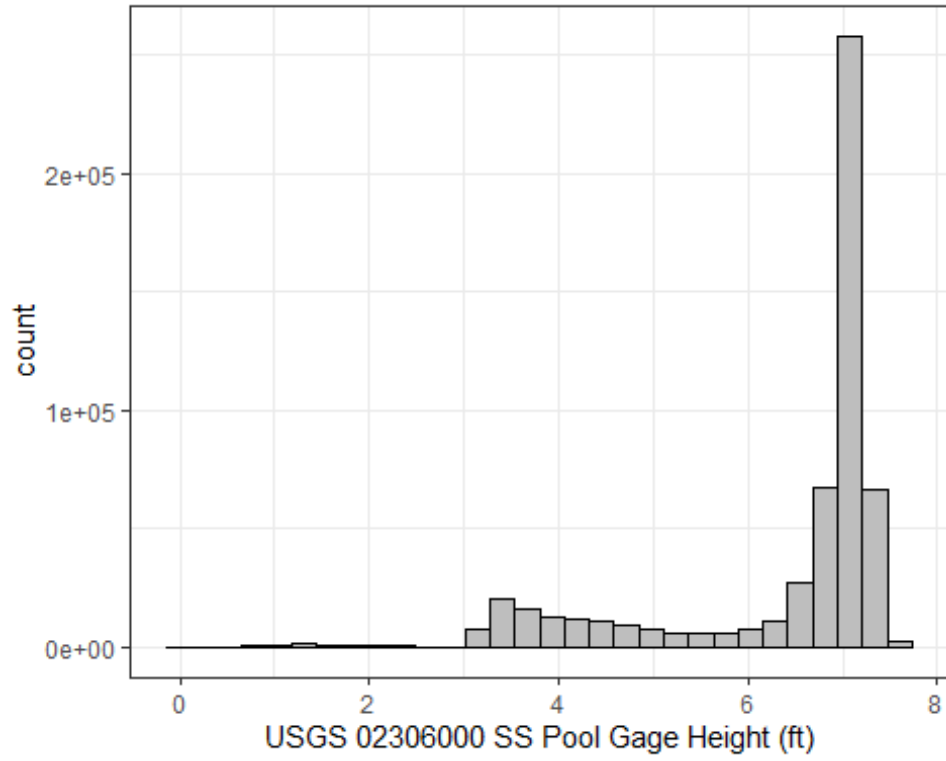
File name and path: [/USGS/SSP/USGS\\_SSP\\_Continuous.xlsx](#)

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Sulphur Springs at Sulphur Springs FL - 02306000.

Data include gage height and surface temperature and specific conductance

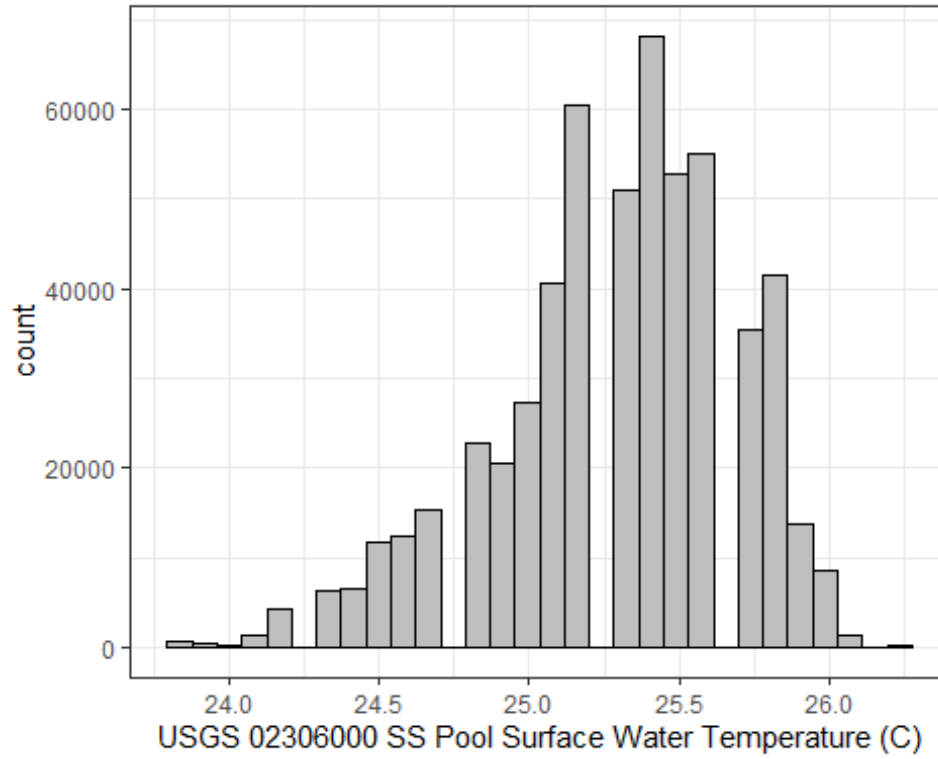
Summary statistics for surface parameters are summarized below based on the period of record of October 1, 2007 to December 31, 2023

**DRAFT**



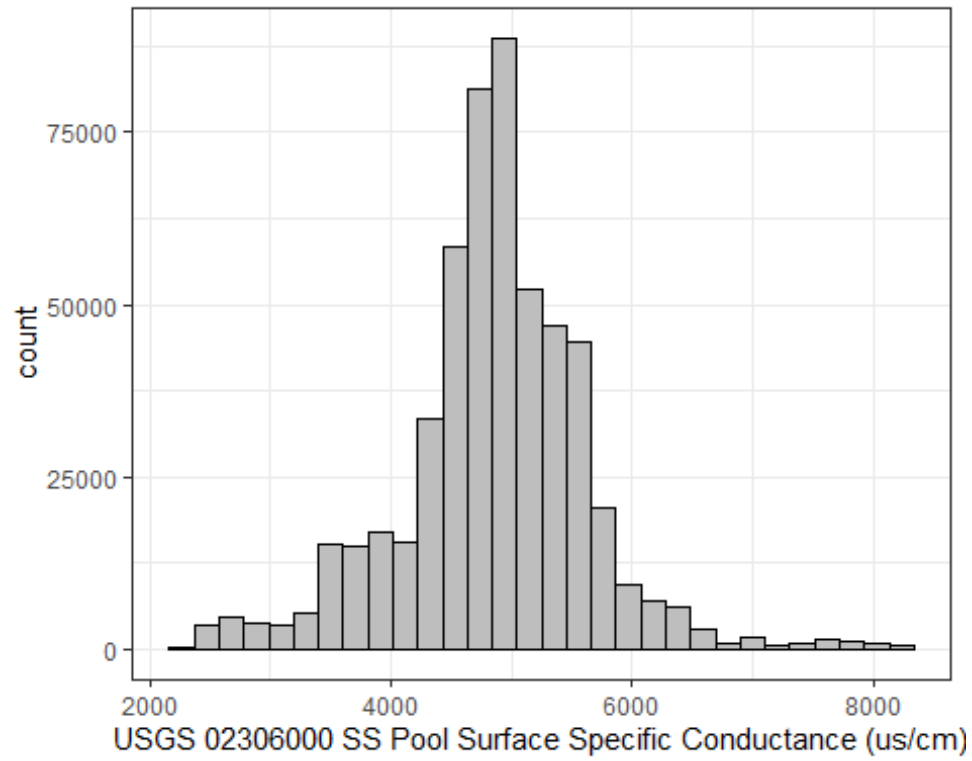
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
## -0.100   6.500   7.020   6.382   7.130   7.500   9265
## [1] "A" "P"
```

**DRAFT**

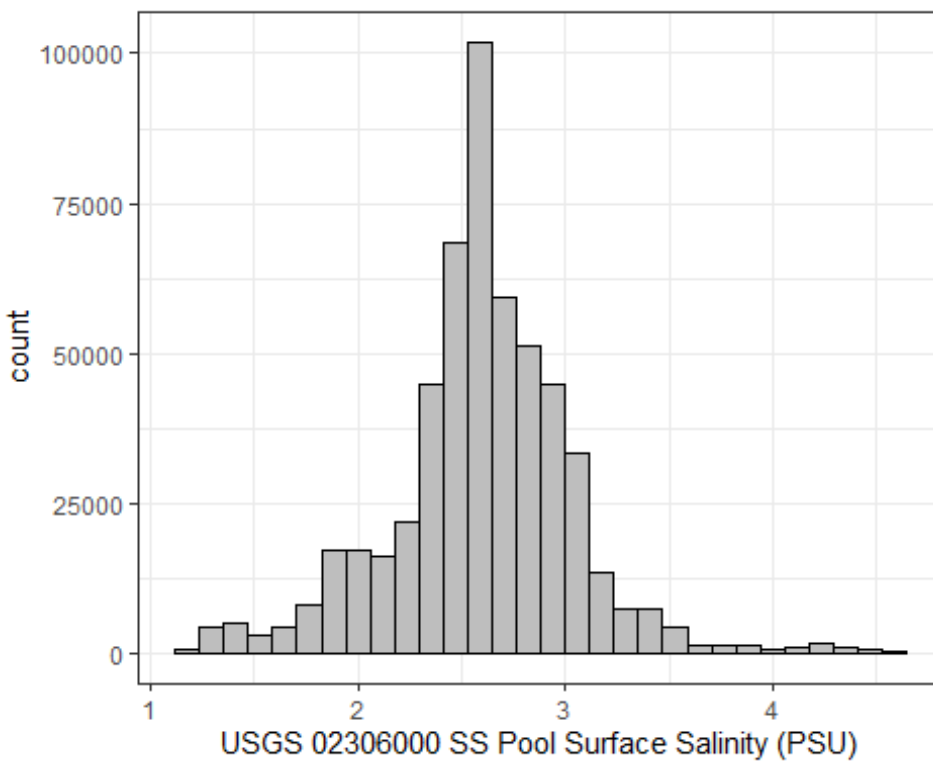


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      23.80   25.10   25.30   25.29   25.60   26.20   11492
## [1] "A" "P"
```

**DRAFT**



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      2310    4500    4860    4850    5290    8280    26547
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	1.183	2.394	2.599	2.596	2.844	4.592	26547

### USGS 023060003 Sulphur Springs Run

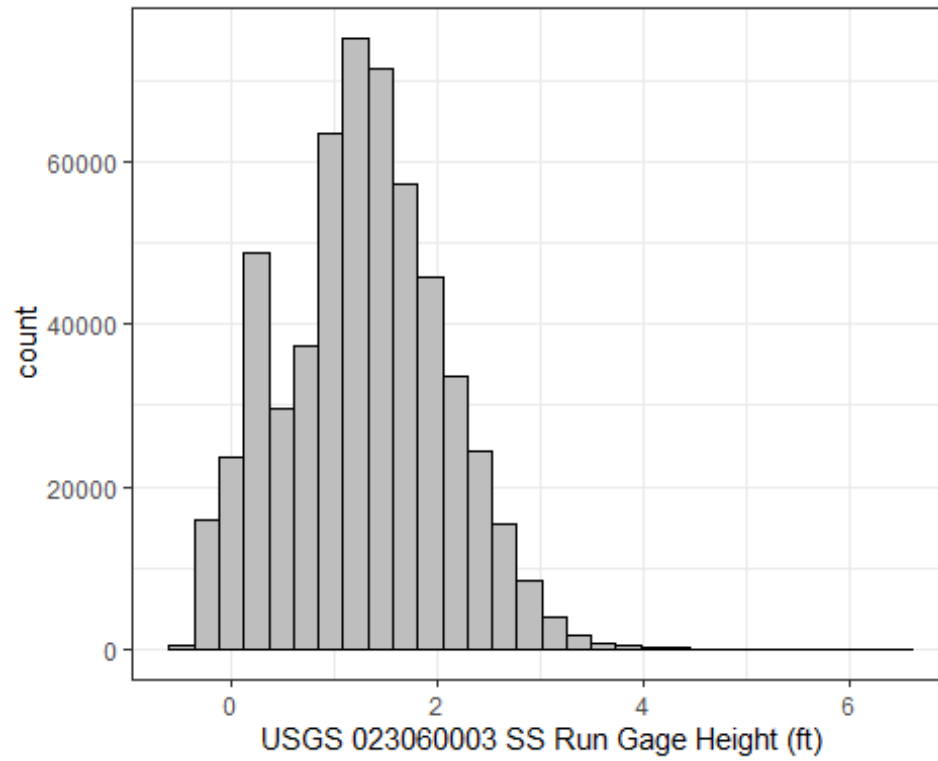
File name and path: [/USGS/SSR/USGS\\_SSR\\_Continuous.xlsx](#)

Metadata: R Script provided in tab in raw data file was used to pull the 15 minute continuous data through December 31, 2023 for Sulphur Springs Run at Sulphur Springs FL - 023060003.

Data include gage height, and surface temperature, and specific conductance

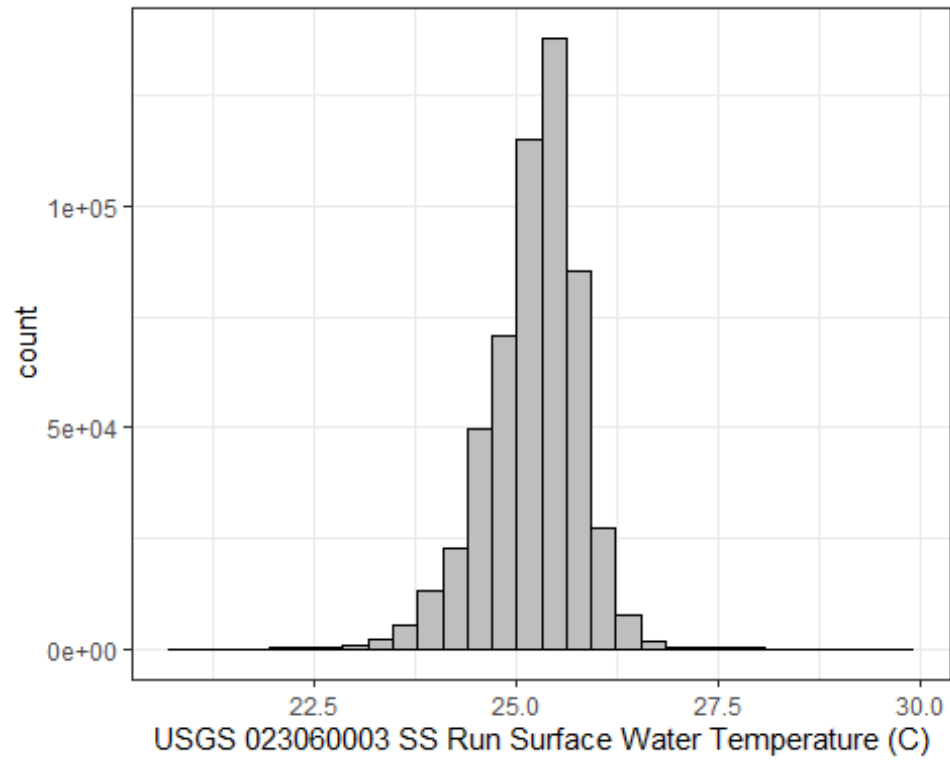
Summary statistics for surface parameters are summarized below based on the period of record of October 1, 2007 to December 31, 2023

**DRAFT**



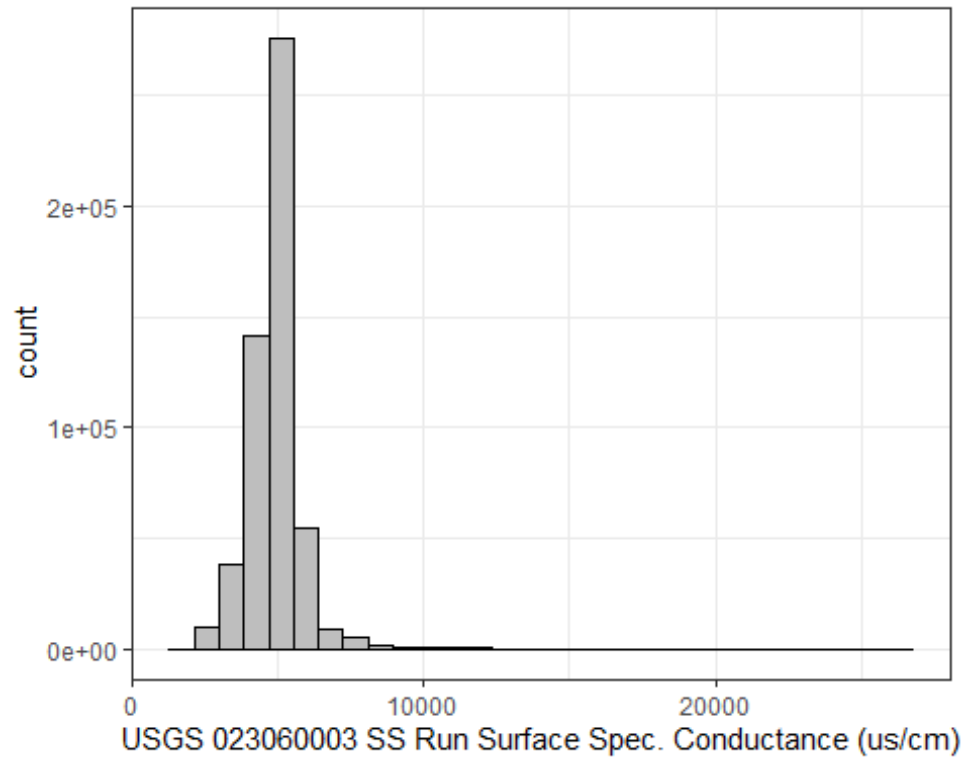
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##    -0.53    0.76     1.28     1.27    1.78     6.45    11941
## [1] "A" "P"
```

**DRAFT**

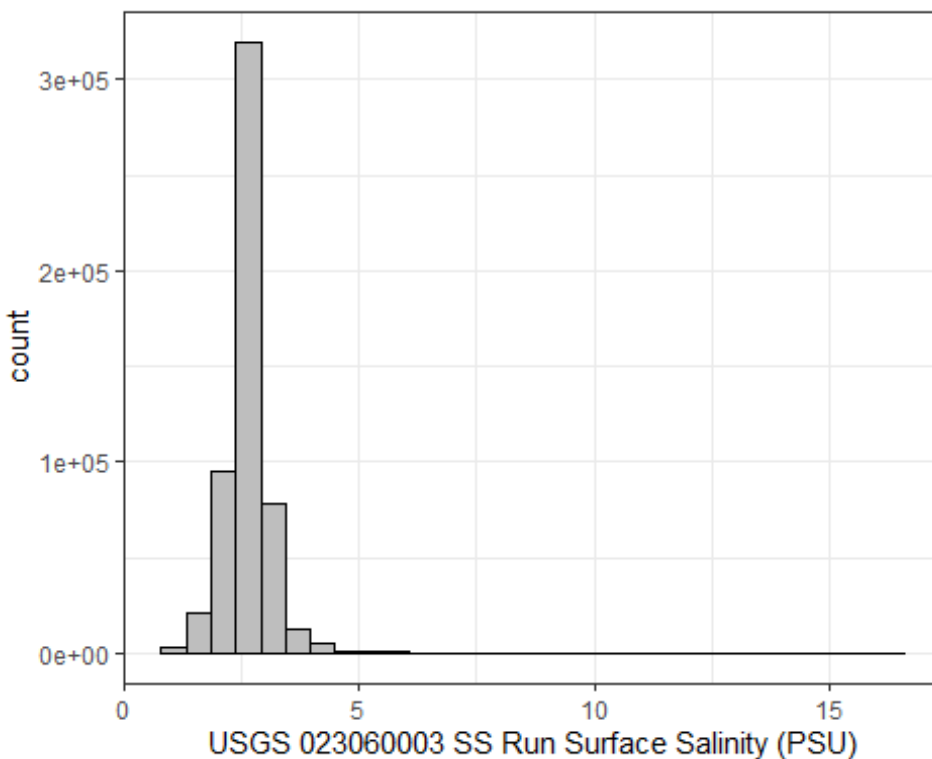


```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.     NA's
##      21.00  24.90   25.30   25.24  25.60   29.90   25679
## [1] "A" "P"
```

**DRAFT**



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##      2020   4520    4850    4888   5250   26700   32742
## [1] "A" "P"
```



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	1.03	2.41	2.59	2.62	2.82	16.33	32742

---

## City of Tampa (COT) Hourly data

This subsection describes the individual COT continuous recorder data files provided in the data dictionary.

---

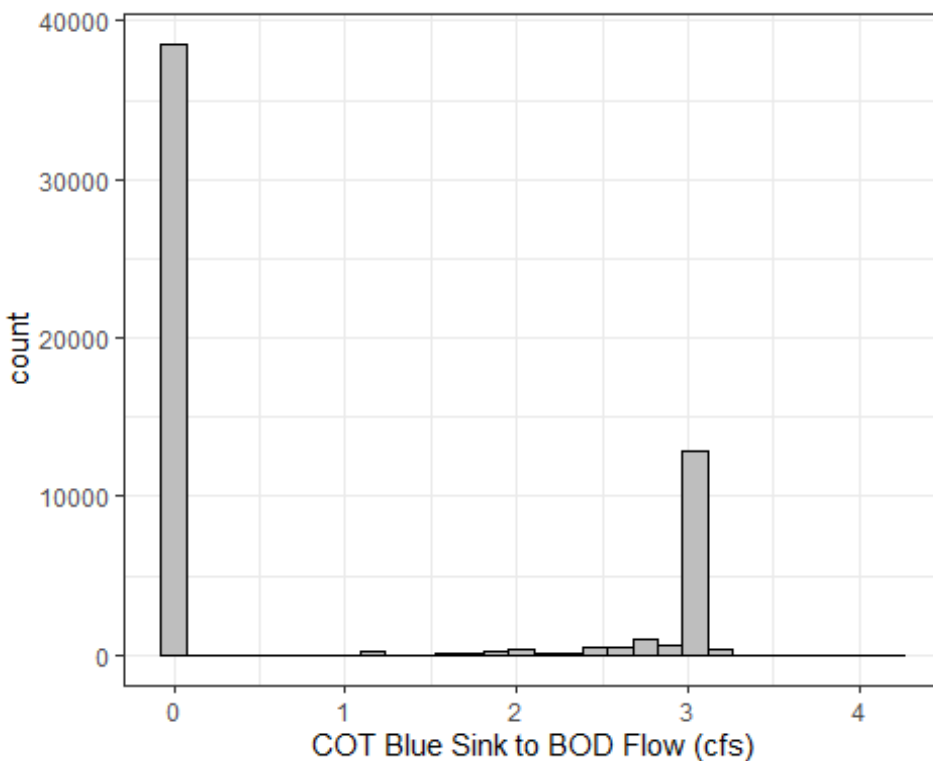
### Blue Sink Pumped to Base of Dam

#### File name and

path:/COT/Bluesink\_to\_BOD/COT\_BS\_Pumped\_2\_BOD\_Hourly\_20170822\_20231231.xlsx

Metadata: This data was provided by John Ring, City of Tampa. The file contains City of Tampa hourly pumpage data for the Lower Hillsborough River Recovery Strategy and minimum flow implementation. The file was truncated by Danielle Rogers, Environmental Flows and Levels Section, Southwest Florida Water Management District to only represent one source, water pumped from Blue Sink to the base of dam by City of Tampa.

Summary statistics for parameters are summarized below based on the period of record of August 22, 2017 to December 31, 2023.



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.0000	0.0000	0.0000	0.8996	2.8000	4.2000	555

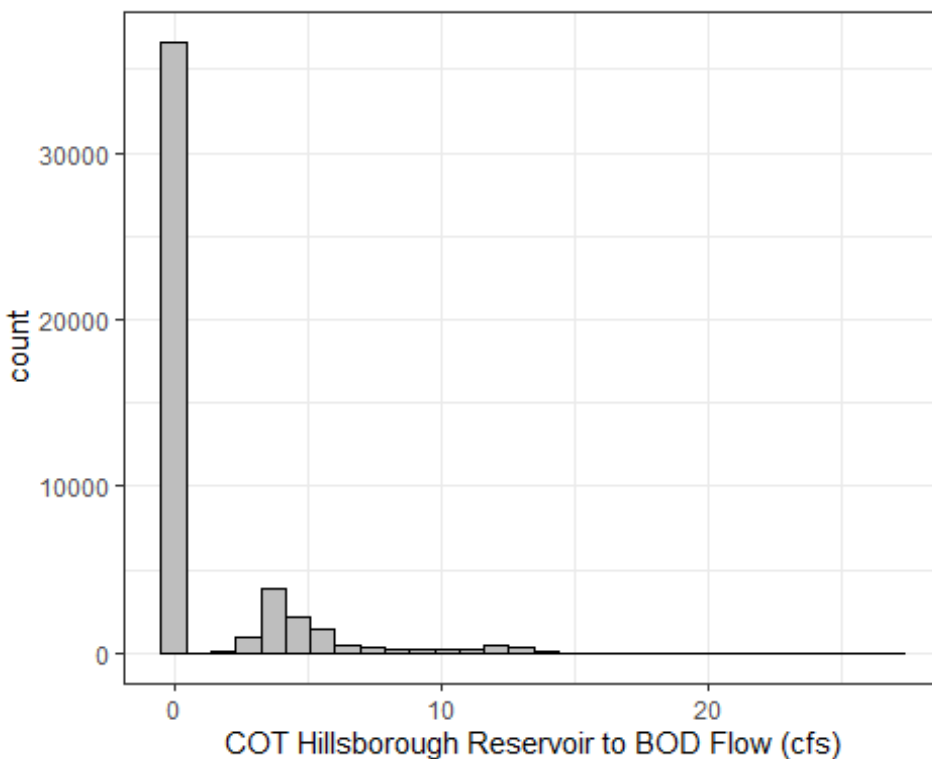
### Hillsborough Reservoir Pumped to Base of Dam

#### File name and

path:/COT/HRR\_to\_BOD/COT\_HRR\_Pumped\_2\_BOD\_Hourly\_20180720\_20231231.xlsx

This data was provided by John Ring, City of Tampa. The file contains City of Tampa hourly pumpage data for the Lower Hillsborough River Recovery Strategy and minimum flow implementation. The file was truncated by Danielle Rogers, Environmental Flows and Levels Section, Southwest Florida Water Management District to only represent one source, water pumped or delivered via sluice gate from the Hillsborough River Reservoir to the base of dam by the City of Tampa.

Summary statistics for parameters are summarized below based on the period of record of July 20, 2018 to December 31, 2023.



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.000	0.000	0.000	1.295	0.000	26.900	493

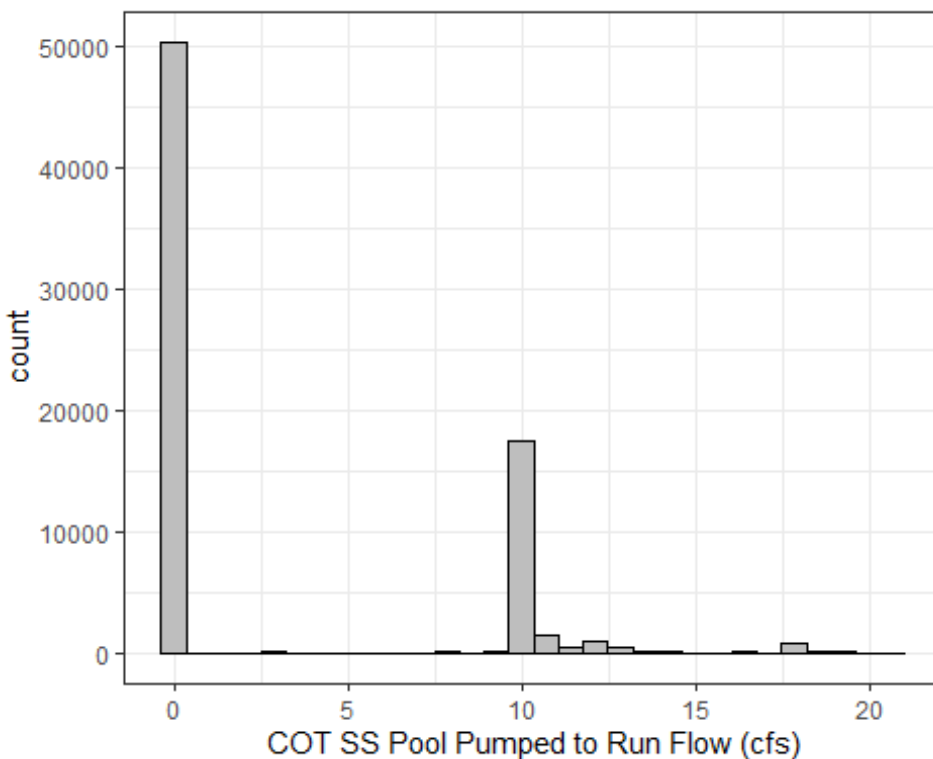
### Sulphur Springs Pool Pumped to Run

#### File name and

path:/COT/SS\_Pumped\_to\_Run/COT\_SS\_Pumped\_2\_Run\_Hourly\_20150601\_20231231.xlsx

This data was provided by John Ring, City of Tampa. The file contains City of Tampa hourly pumpage data for the Lower Hillsborough River Recovery Strategy and minimum flow implementation. The file was truncated by Danielle Rogers, Environmental Flows and Levels Section, Southwest Florida Water Management District to only represent one source, water pumped from Sulphur Springs Pool to Sulphur Springs Run by the City of Tampa.

Summary statistics for parameters are summarized below based on the period of record of June 1, 2015 to December 31, 2023.



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	0.00	0.00	3.35	10.00	20.70	1721

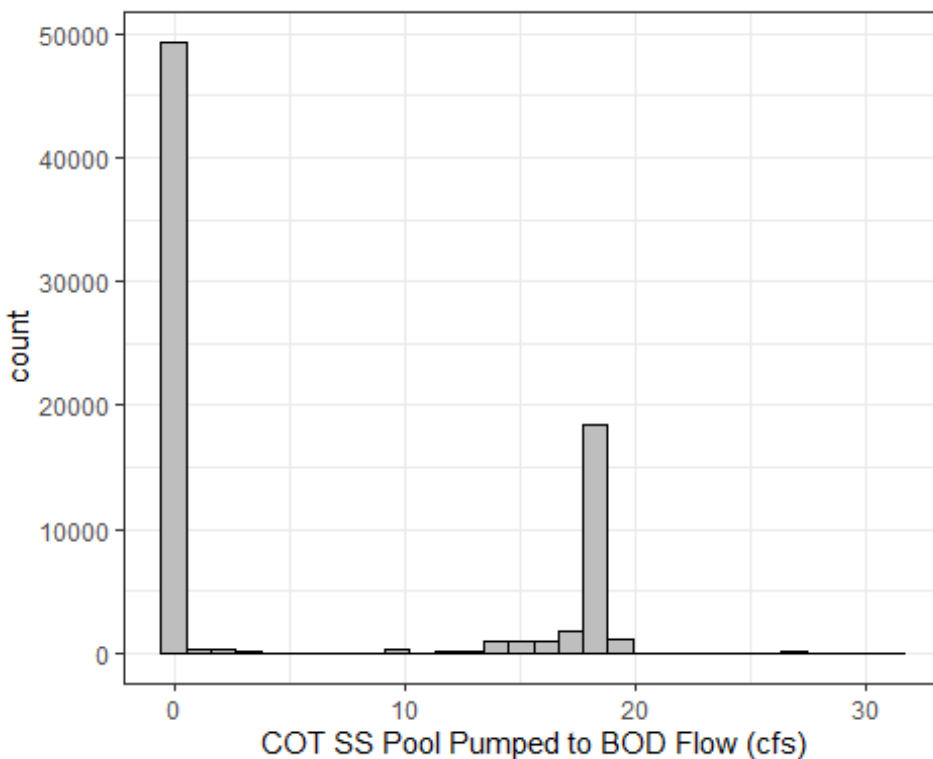
### Sulphur Springs Pool Pumped to Base of Dam

#### File name and path:

[/COT/SS\\_to\\_BOD/COT\\_SS\\_Pumped\\_2\\_BOD\\_Hourly\\_20150601\\_20231231.xlsx](#)

This data was provided by John Ring, City of Tampa. The file contains City of Tampa hourly pumpage data for the Lower Hillsborough River Recovery Strategy and minimum flow implementation. The file was truncated by Danielle Rogers, Environmental Flows and Levels Section, Southwest Florida Water Management District to only represent one source, water pumped from Sulphur Springs Pool to the base of dam by City of Tampa.

Summary statistics for parameters are summarized below based on the period of record of June 1, 2015 to December 31, 2023.



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.000	0.000	0.000	5.875	18.000	31.200	44

## Tampa Bay Water HBMP Data

Filename and path:/TBW\_HBMP/LHR\_HBMP\_CR.txt

The Tampa Bay Water Hydrobiological Monitoring Program deploys and maintains three continuous recorders in the Lower Hillsborough River at Columbus, Crosstown, and Sligh Avenue. Emily Keenan from ESA provided an excel file of continuously recorded data at the three sites on May 18 2024 which were read into SAS software, organized and prepared for analysis as a single file. Results where data were flagged as “NV” or where the qualifier2 field was denoted as “Rejected” were set to missing as described in the metadata below. Therefore, no quality codes were imported. Specific conductance was converted to us/cm from ms/cm by multiply values by 1000.

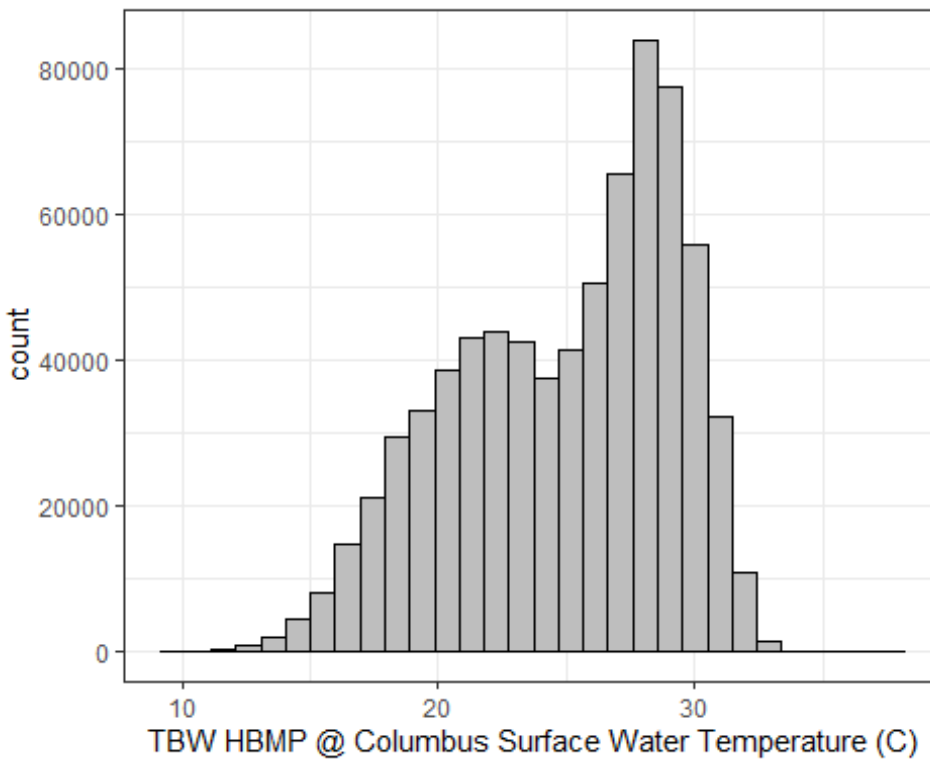
Summary statistics are provided below based on the period of record of February 15, 2001 to December 31, 2023.

**Columbus: Latitude 27°57.987 Longitude 82°28.497**

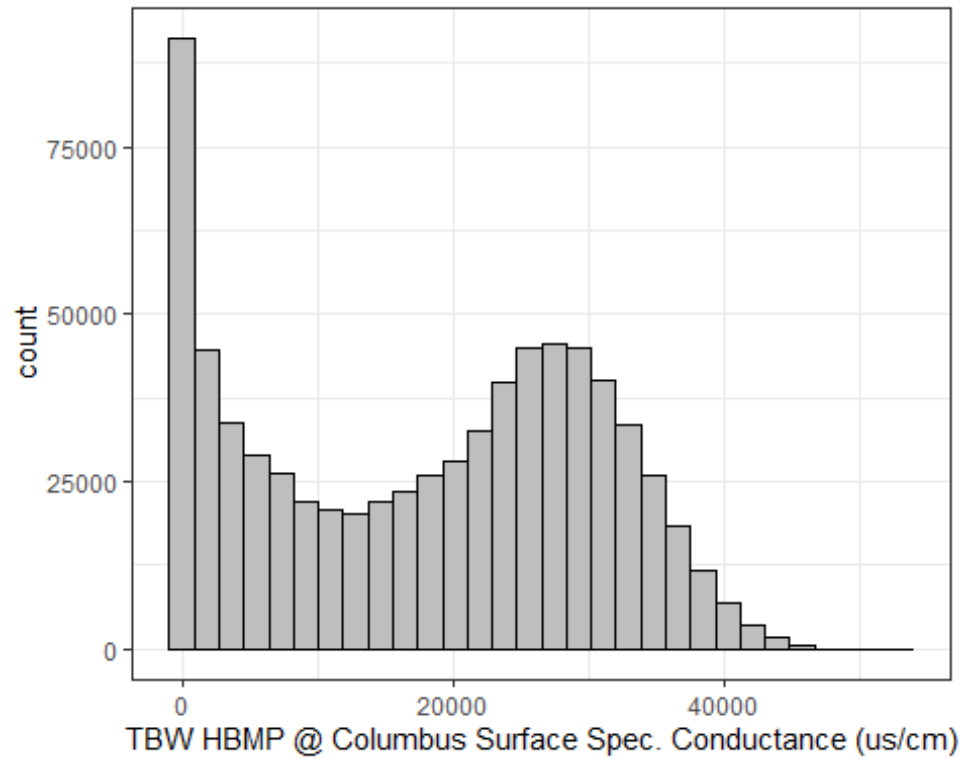
Metadata: Continuously recorded data (15-minute interval) collected at Columbus Avenue on the Hillsborough River. Salinity, specific conductance and temperature data at two vertical locations (bottom and floating top) were collected. All data have undergone an

internal quality control/quality assurance review. Only data without a flagged result of 'NV' should be used for analysis and reporting.

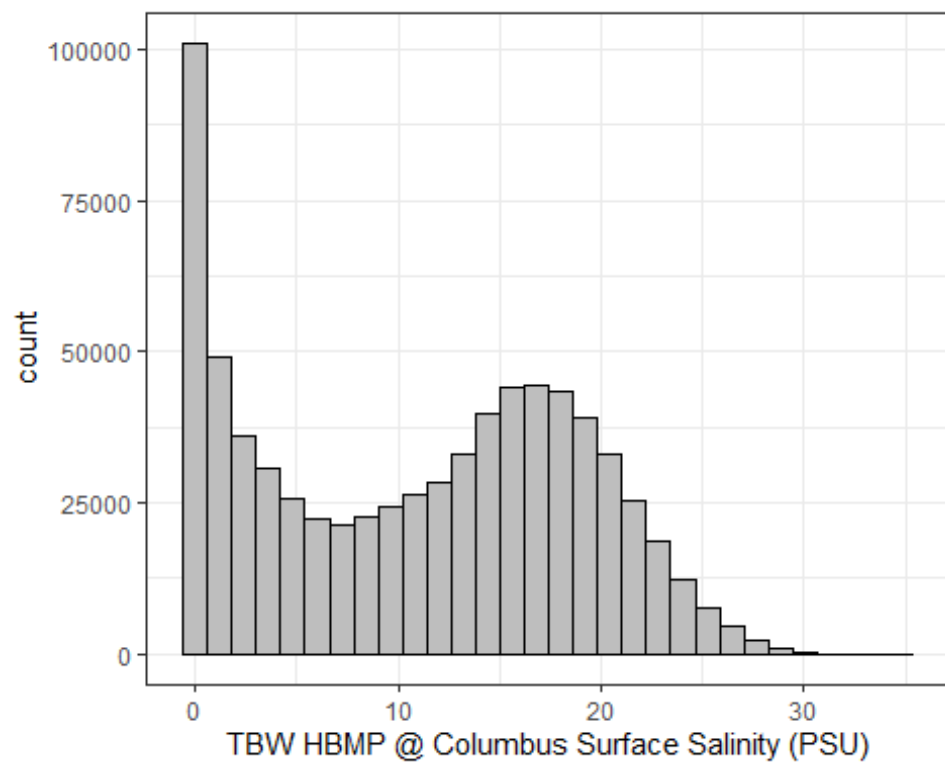
In addition to the metadata procedures, additional QC was performed to remove data with a qualifier2 value of "Rejected" based on examination of data where specific conductivity and salinity data were obviously out of range.



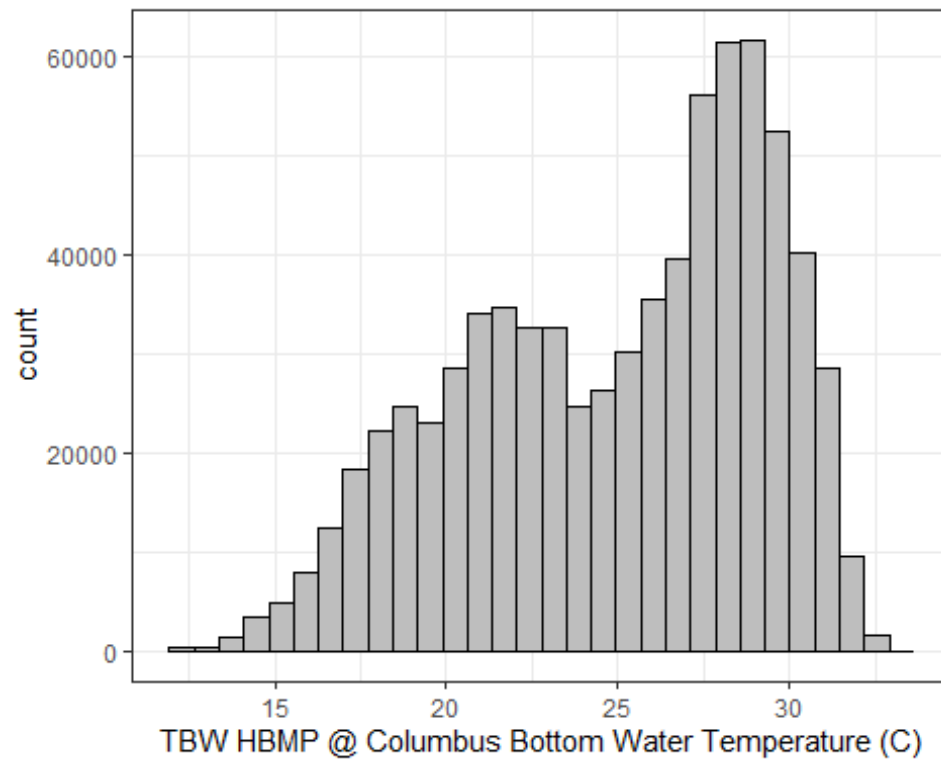
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	9.89	21.54	25.84	24.92	28.48	37.96	65571



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0	5460	19810	18024	28440	53010	65681

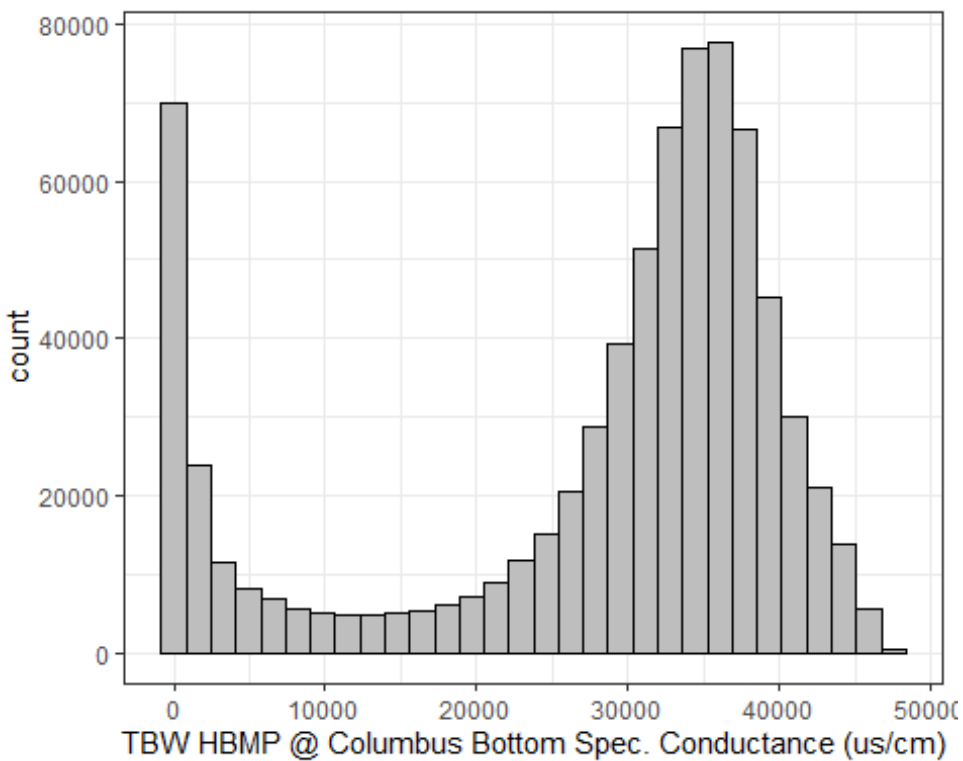


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	2.94	11.79	10.96	17.51	34.85	65610

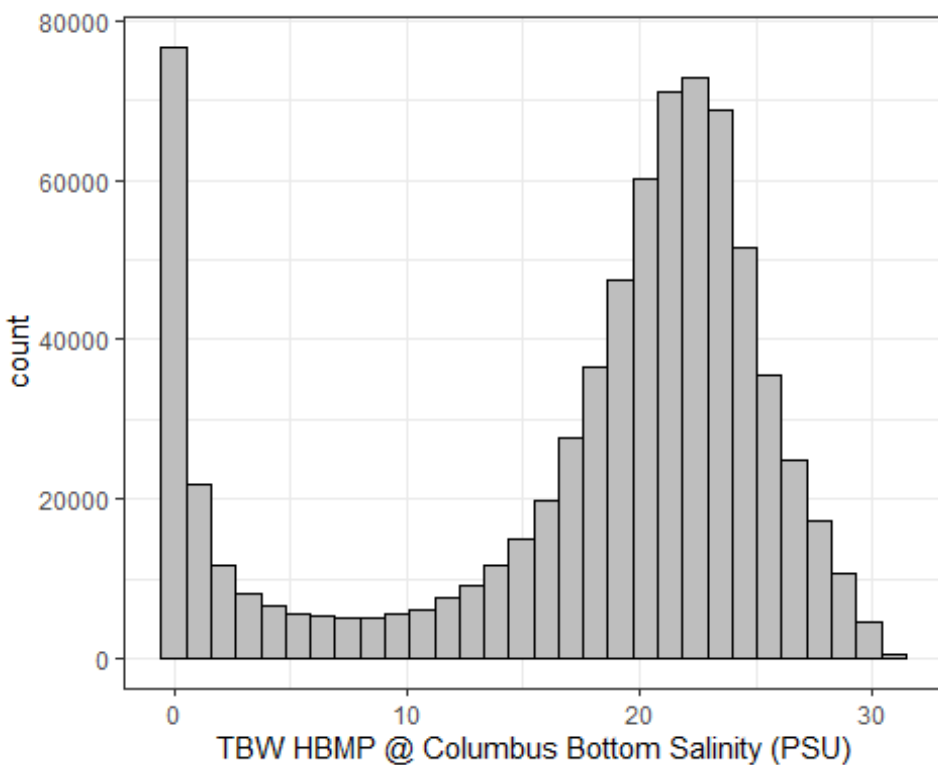


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	11.95	21.46	25.92	24.97	28.64	32.92	54022

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##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	180	23900	32800	27805	36810	47720	58708

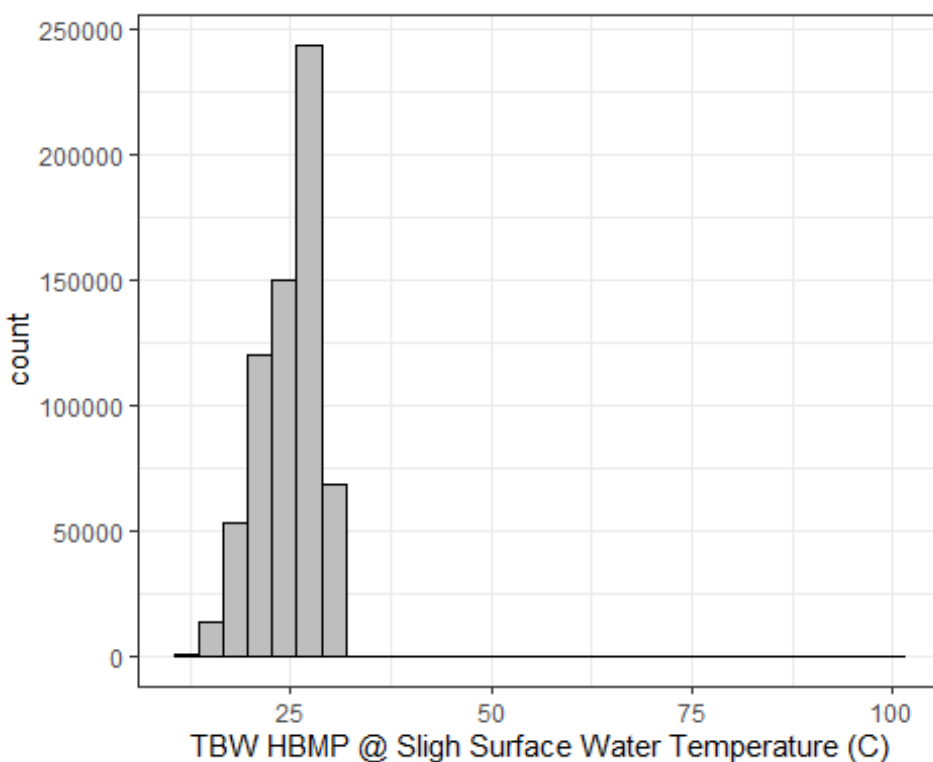


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.08	14.51	20.50	17.43	23.30	30.98	53490

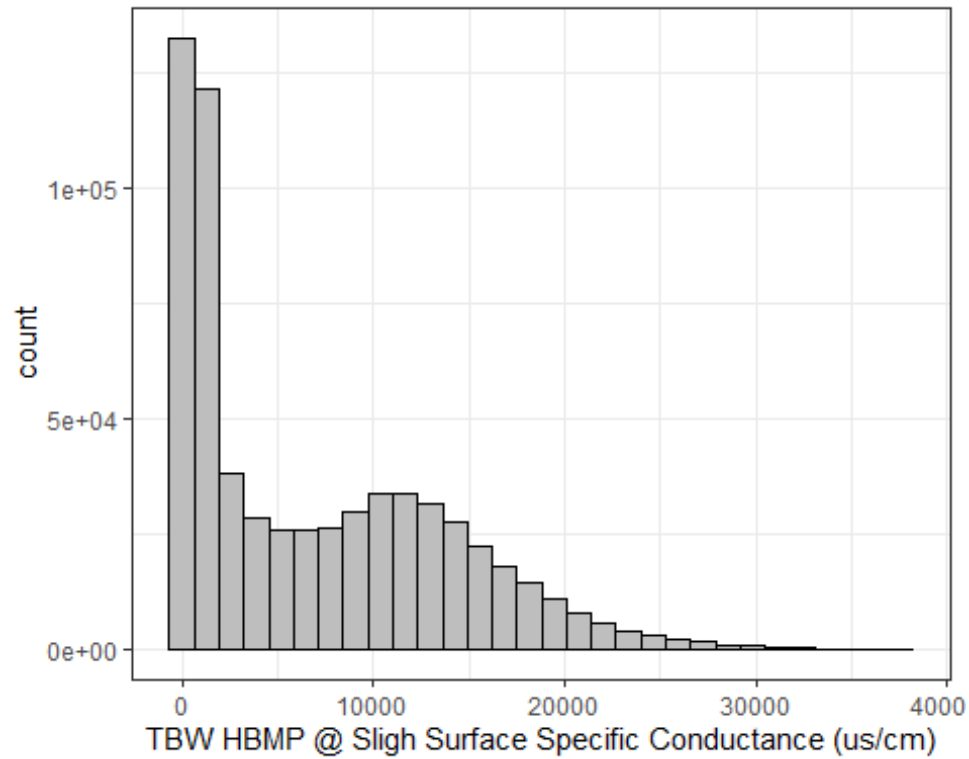
**Sligh: Latitude 28°0.65 Longitude 82°27.99**

Metadata: Continuously recorded data (15-minute interval) collected at Sligh Avenue on the Hillsborough River. Salinity, specific conductance and temperature data at two vertical locations (bottom and floating top) were collected. All data have undergone an internal quality control/quality assurance review. Only data without a flagged result of 'NV' should be used for analysis and reporting.

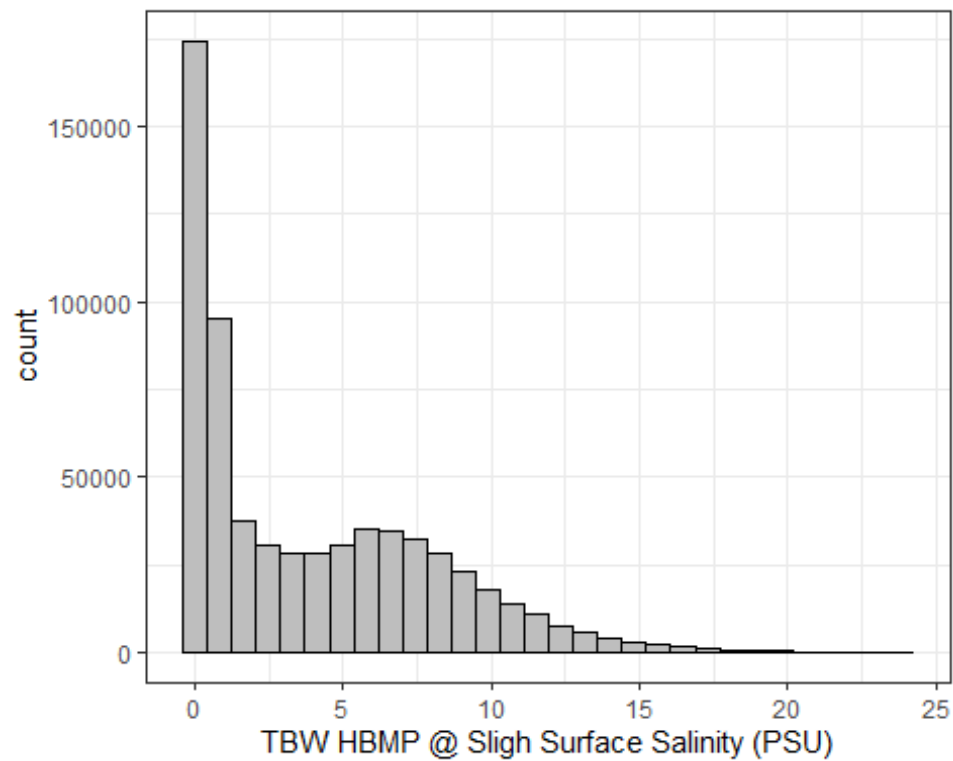
In addition to the metadata, additional QC was performed to remove data with a qualifier2 value of "Rejected" based on examination of data where specific conductivity and salinity data were obviously out of range.



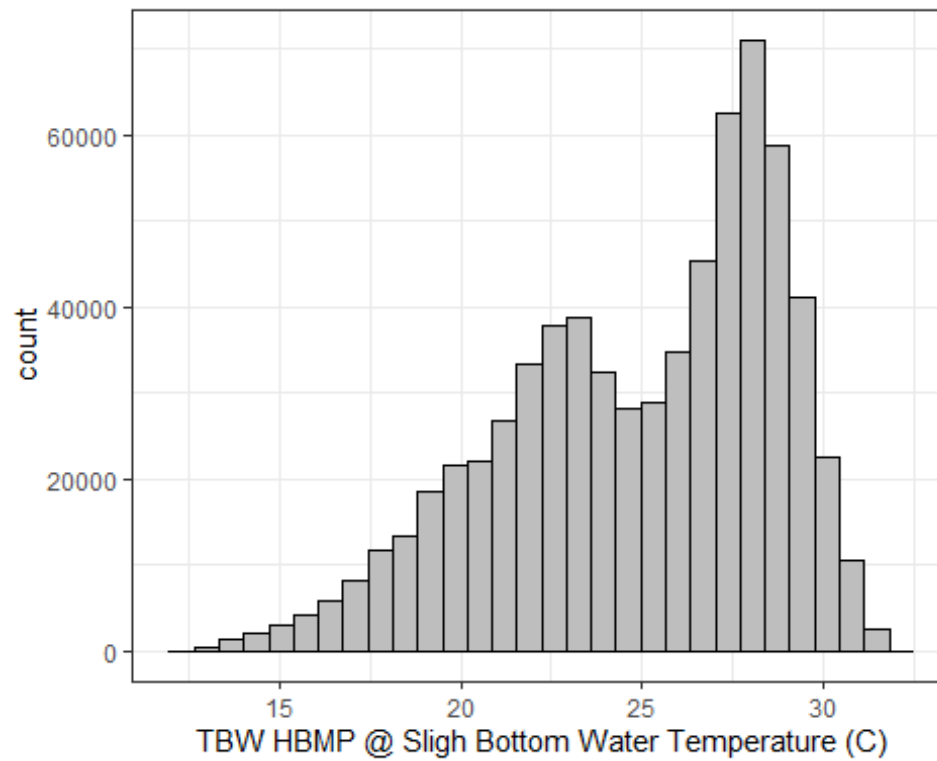
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	11.99	22.27	25.55	24.83	27.78	100.00	154565



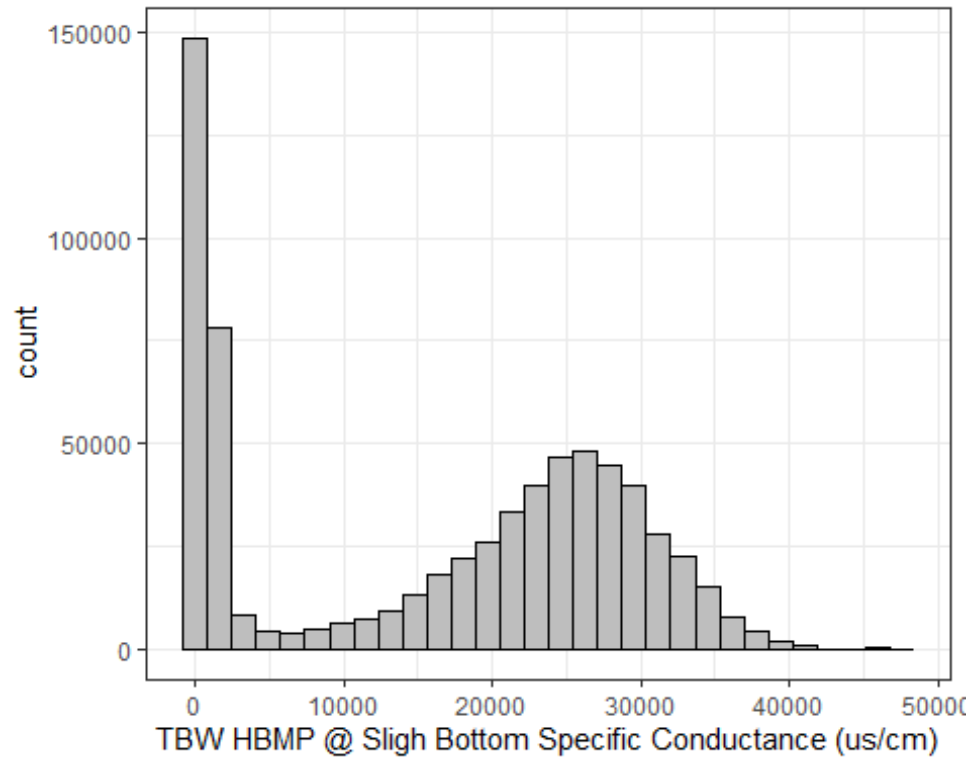
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0	780	4660	6885	11900	37600	156478



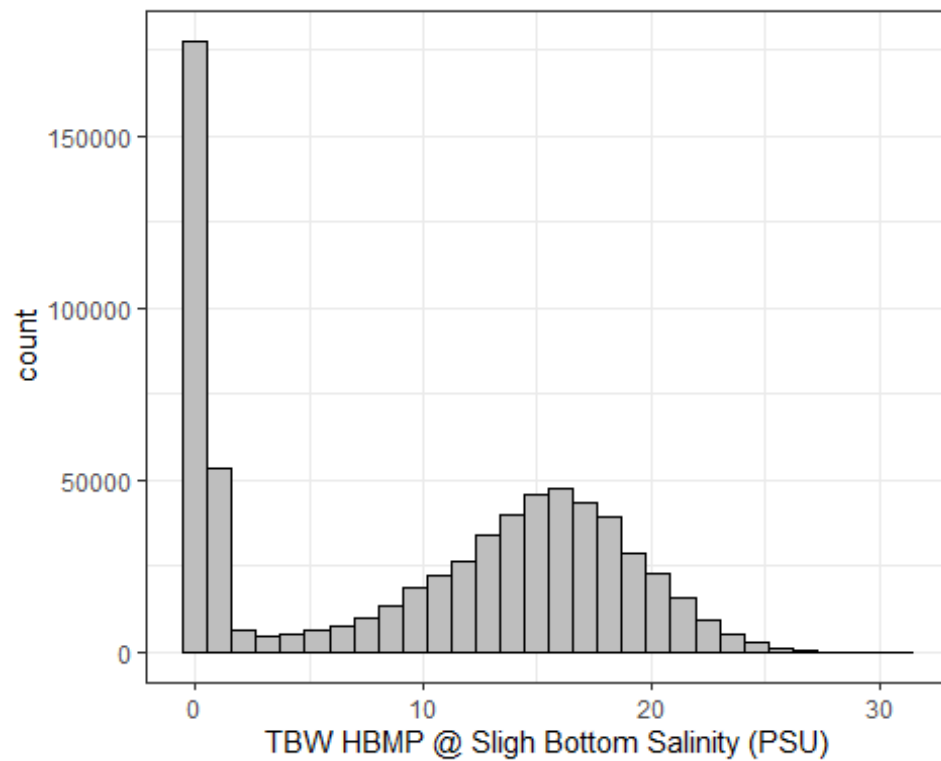
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	0.38	2.48	3.93	6.79	23.86	156439



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	12.16	22.22	25.76	24.93	28.04	32.00	114542



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	10	1020	20050	16292	26900	47629	119257

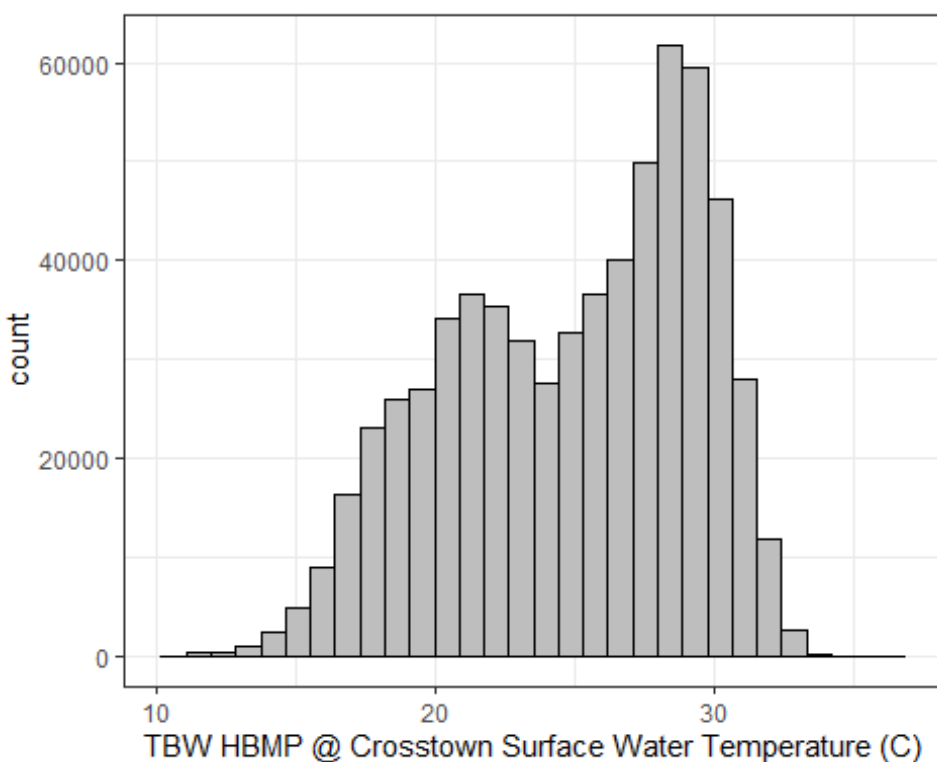


##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	0.51	12.02	9.96	16.53	31.01	114562

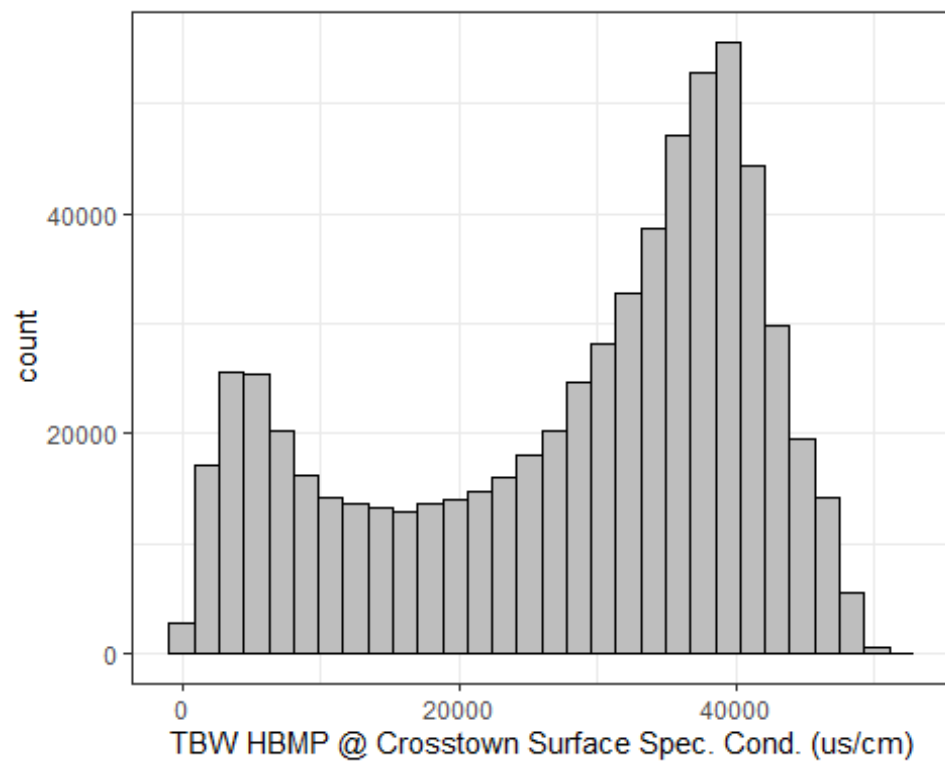
#### Crosstown: Latitude 27°56.578 Longitude 82°27.53

Metadata: Continuously recorded data (15-minute interval) collected at Crosstown on the Hillsborough River. Salinity, specific conductance and temperature data at two vertical locations (bottom and floating top) were collected. All data have undergone an internal quality control/quality assurance review. Only data without a flagged result of 'NV' should be used for analysis and reporting.

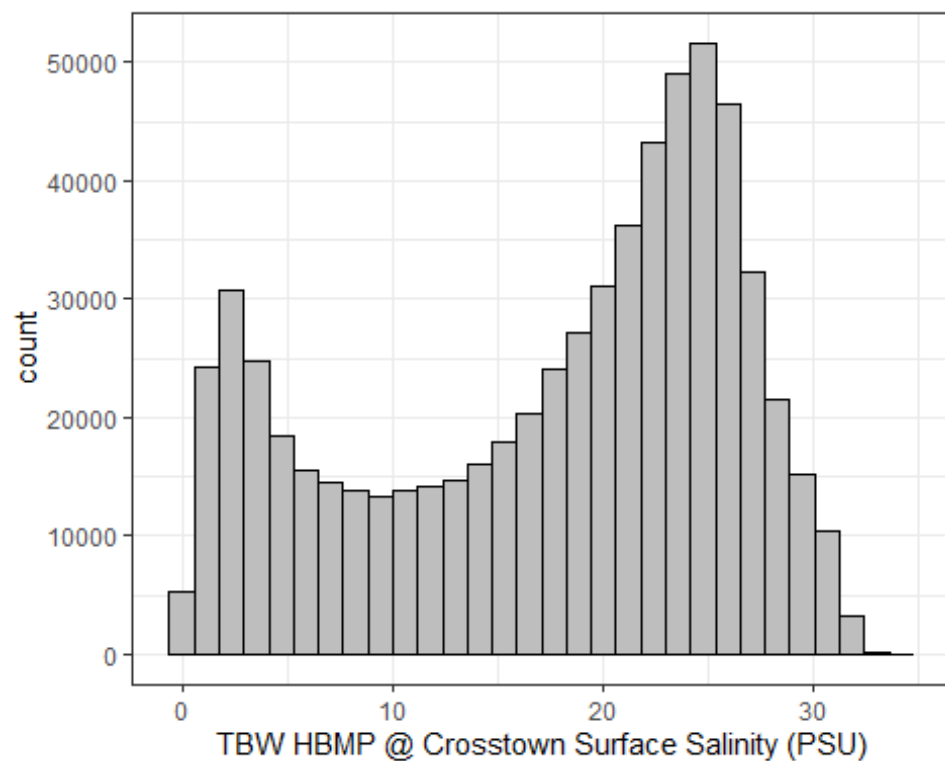
In addition to the metadata, additional QC was performed to remove data with a qualifier2 value of "Rejected" based on examination of data where specific conductivity and salinity data were obviously out of range.



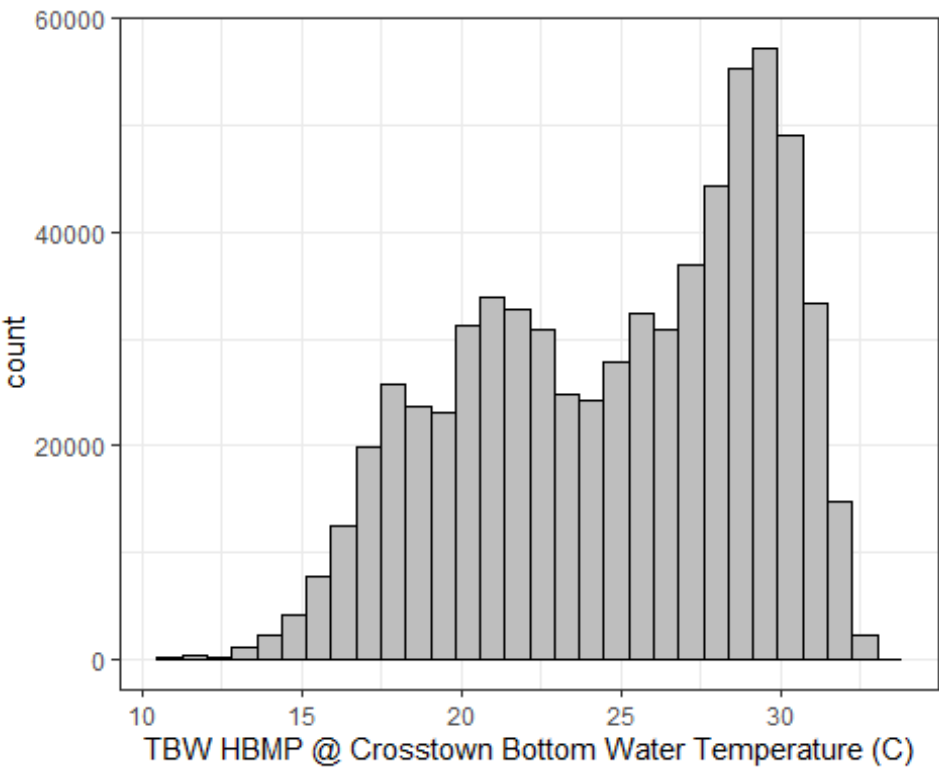
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	10.50	21.28	25.64	24.89	28.68	36.25	158124



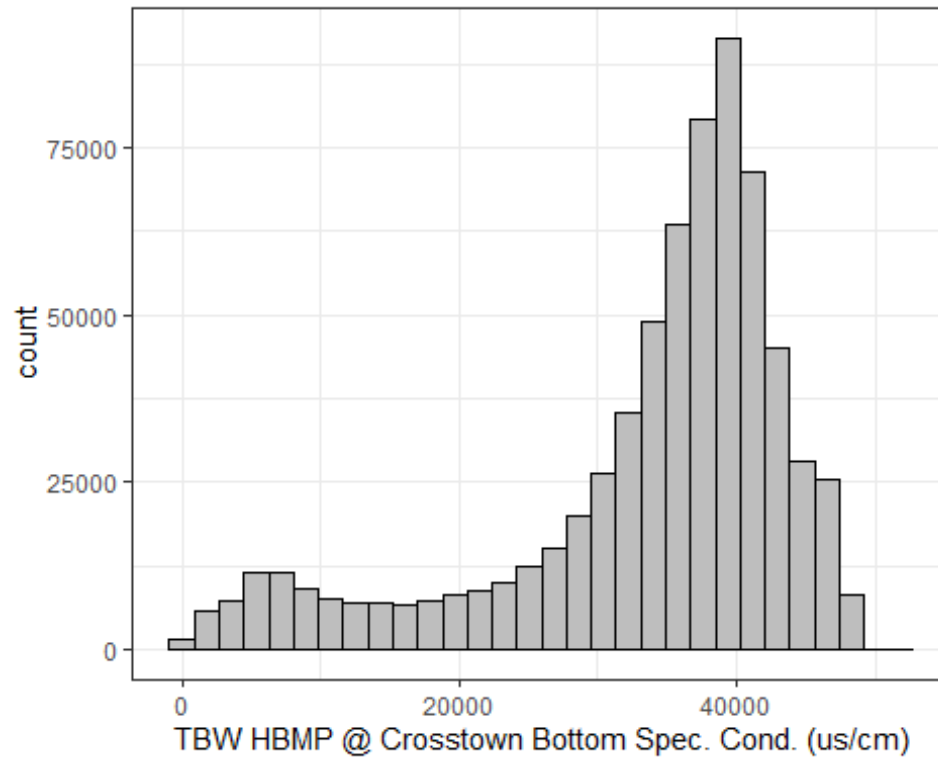
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	6	17200	32180	27933	38700	51930	151726



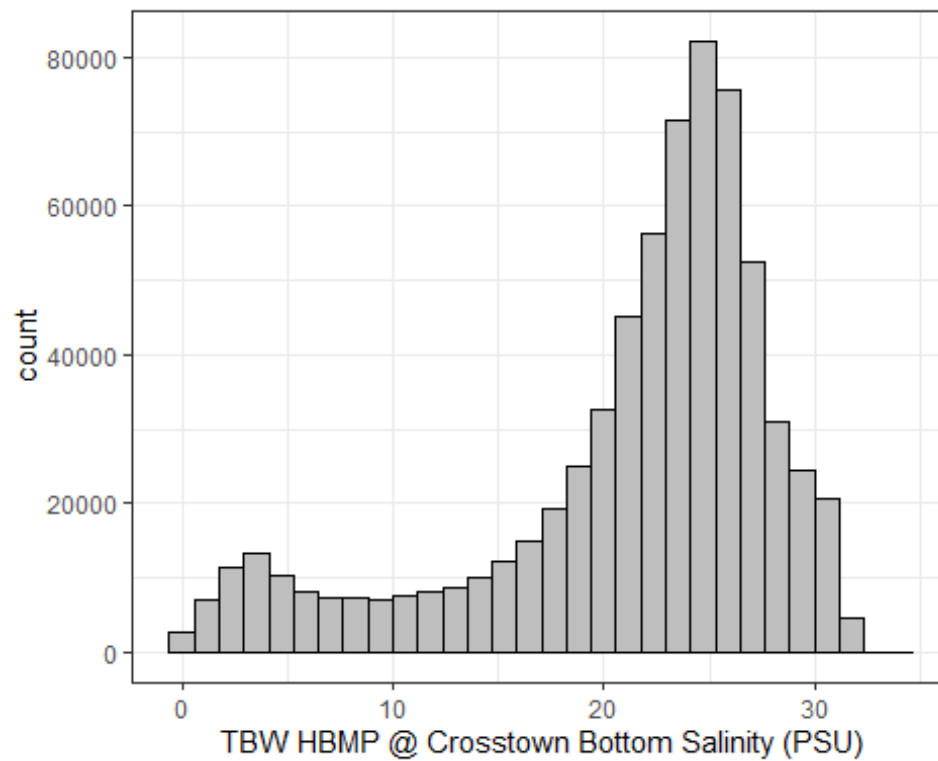
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	10.17	20.09	17.50	24.62	34.22	153638



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	11.03	21.01	25.63	24.86	28.94	33.57	121194



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	4	30550	36920	33589	40450	51918	125390



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	18.90	23.34	21.19	25.84	34.10	125440

## Hillsborough County Environmental Protection Commission (EPC) Data

Nebraska (RKm 13.7) Lat: 28.018383 Lon: -82.44595.

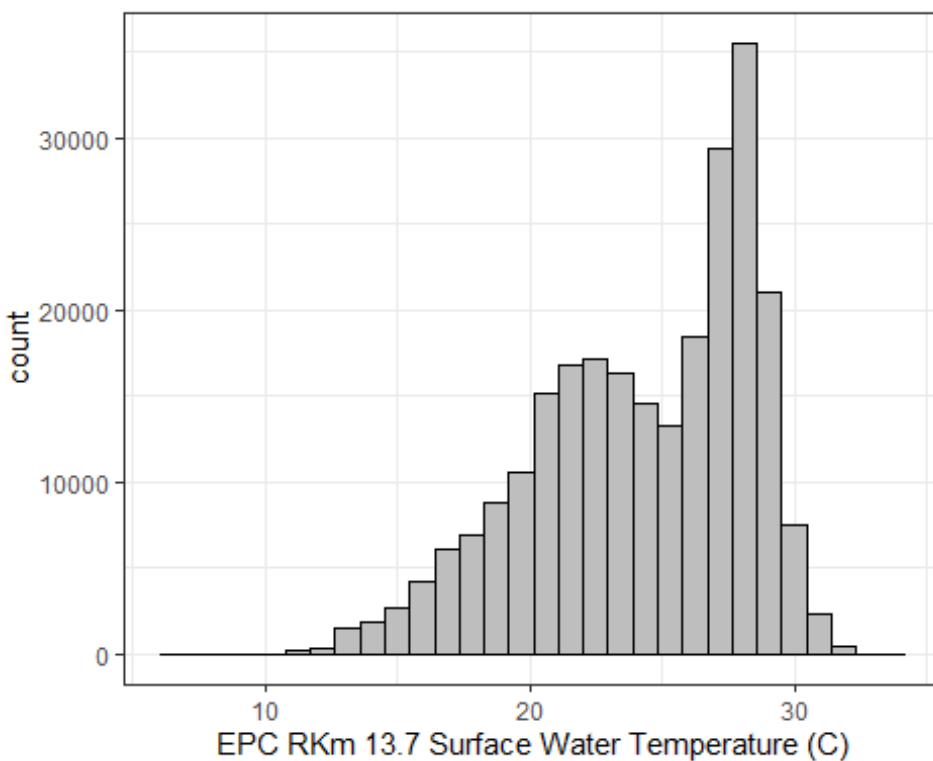
Filename and path: /EPC/EPC\_HRCM\_all.xlsx

Metadata: This is a single continuous recorder cited in the first 5 year assessment report. It is located near Nebraska Avenue (Rkm 13.7).

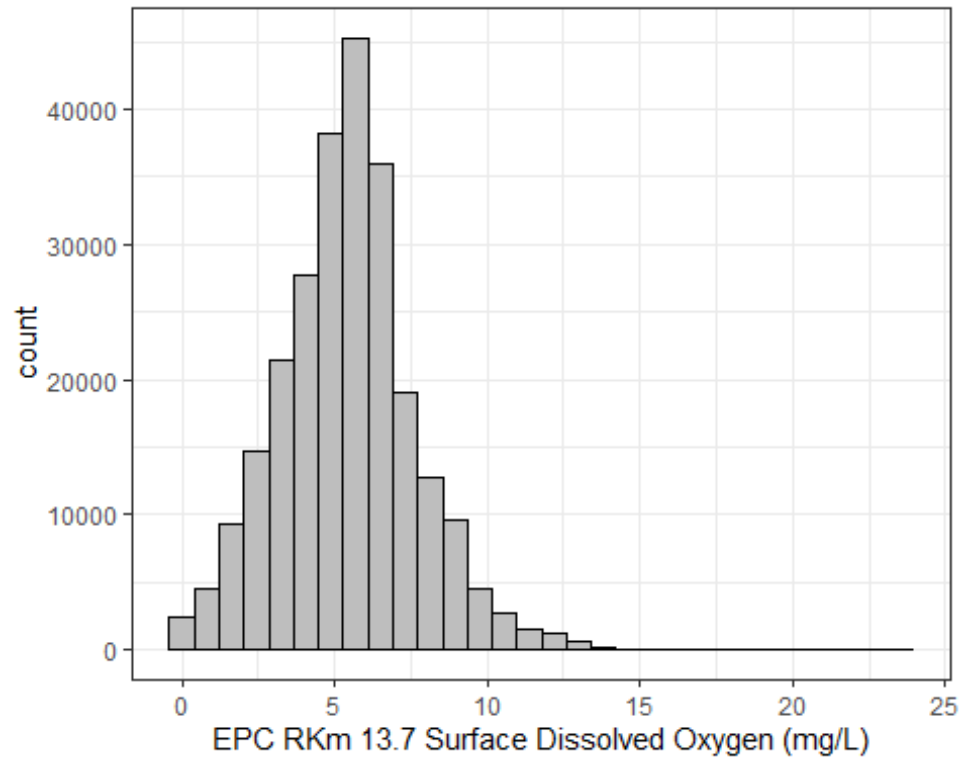
The 15 minute continuous data were obtained from Sara Markham EPC on November 1, 2023. No metadata or quality codes were provided with the source file.

Data include surface and bottom temperature, dissolved oxygen, conductivity, and salinity. Average surface depth is 0.3M and total bottom depth is 1.1m

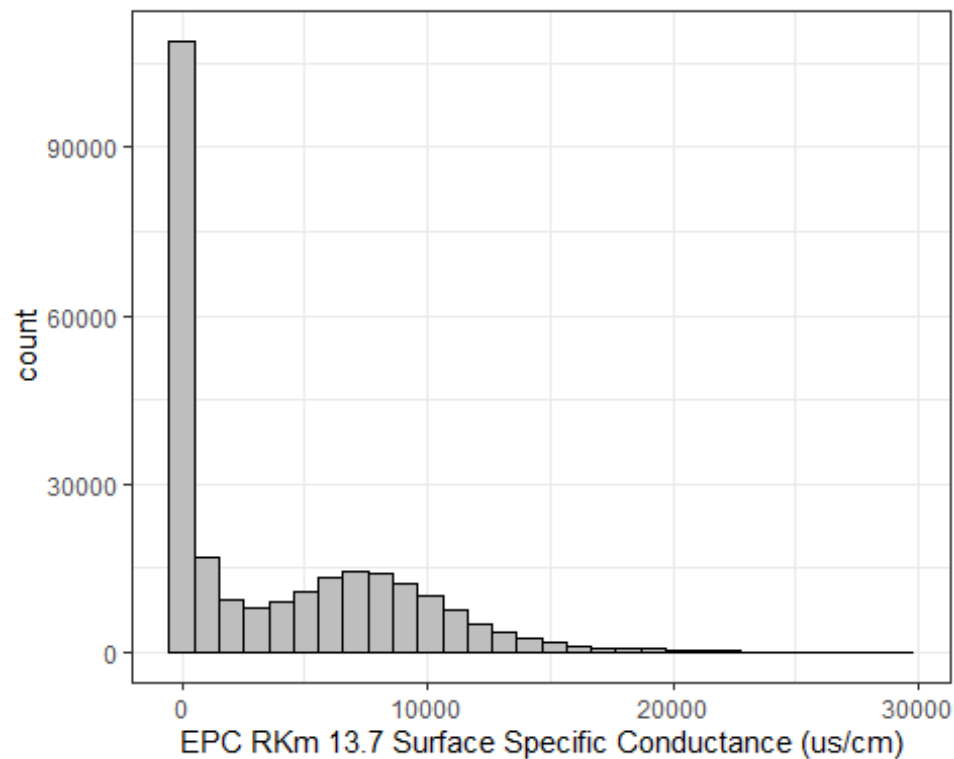
Summary statistics for parameters are summarized below based on the period of record of May 14, 2002 to May 15, 2015.



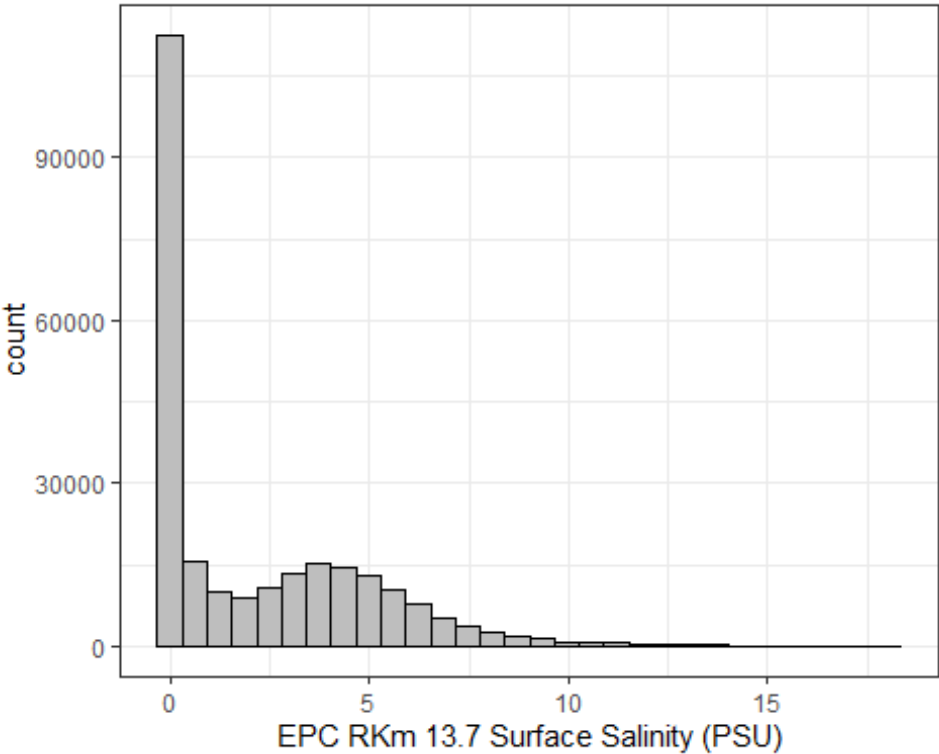
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	6.69	21.33	25.00	24.27	27.74	33.86	204722



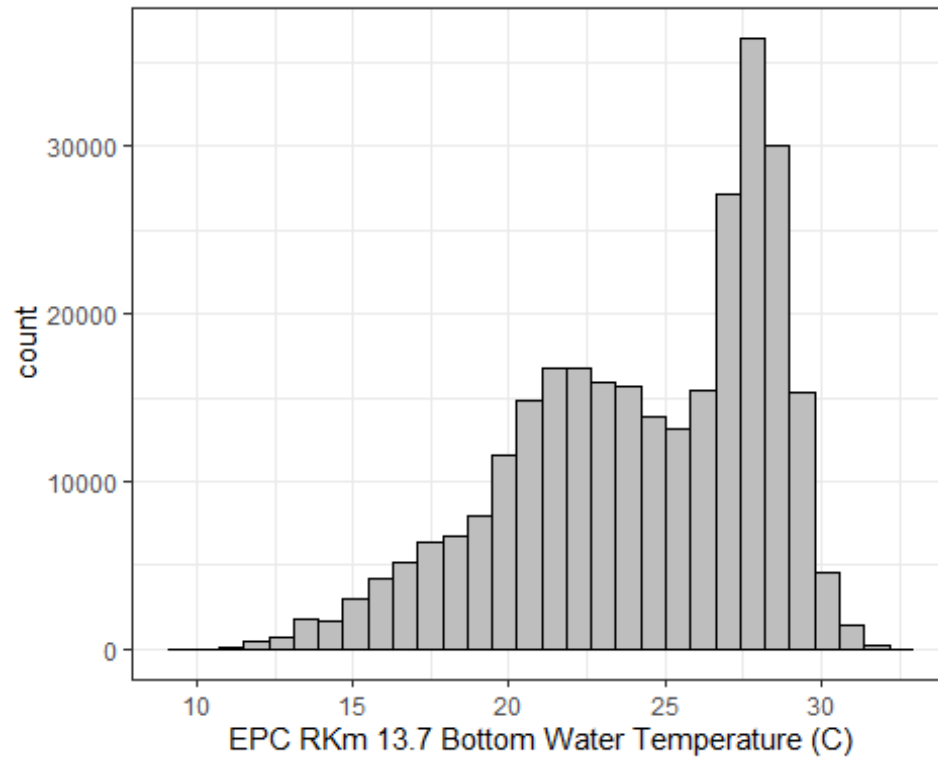
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.01	3.98	5.42	5.40	6.62	23.57	204720



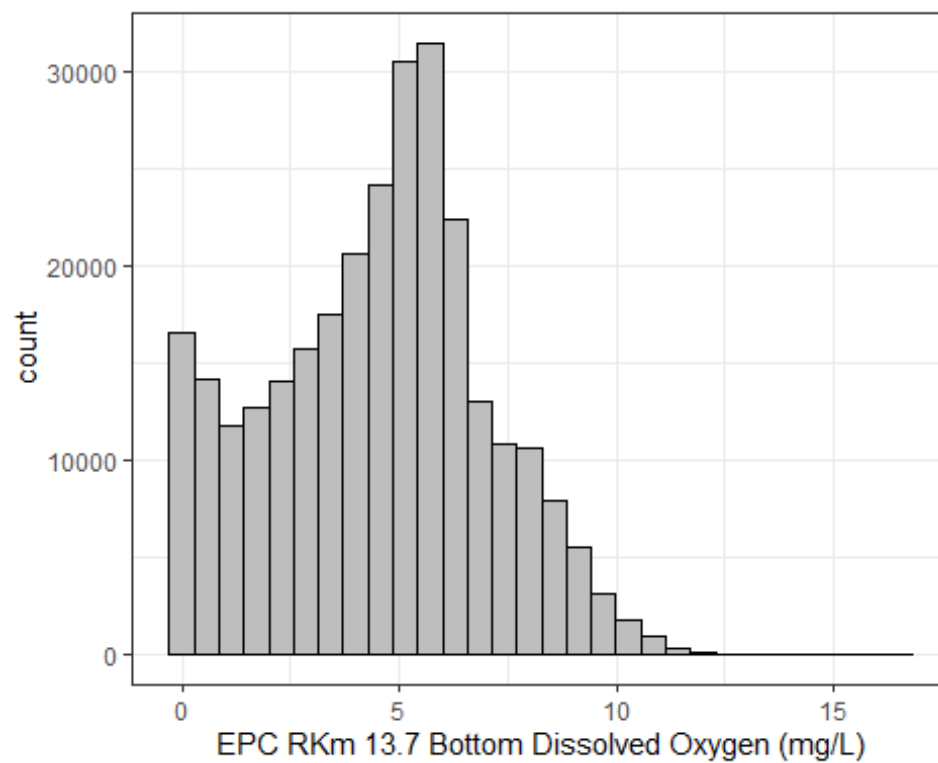
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0	268	1490	4030	7410	29300	204720



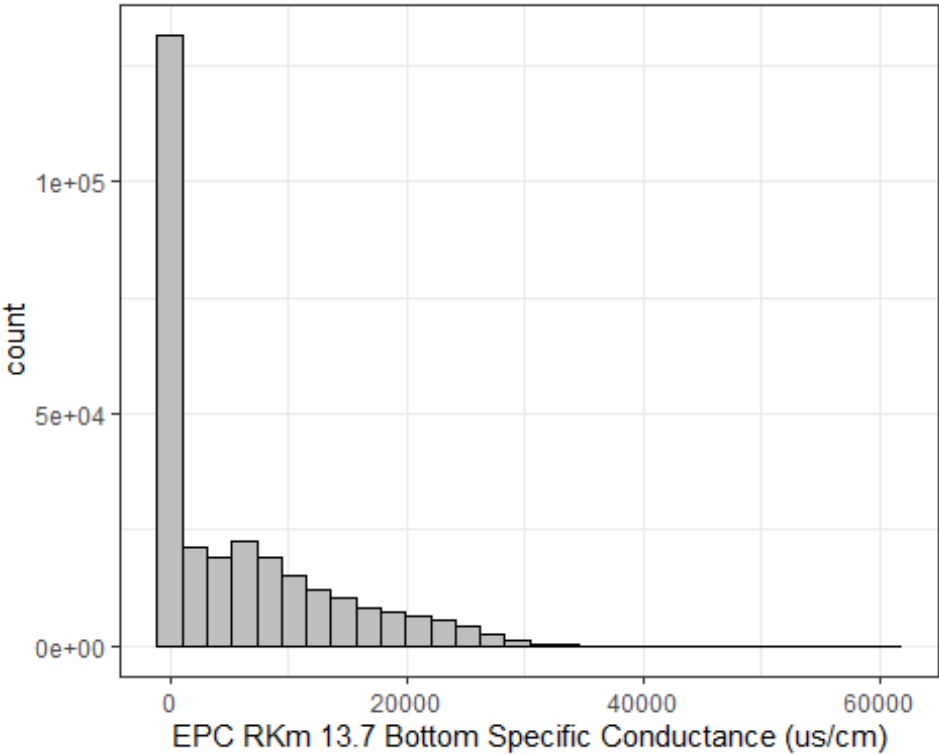
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	0.13	0.76	2.24	4.08	18.05	205703



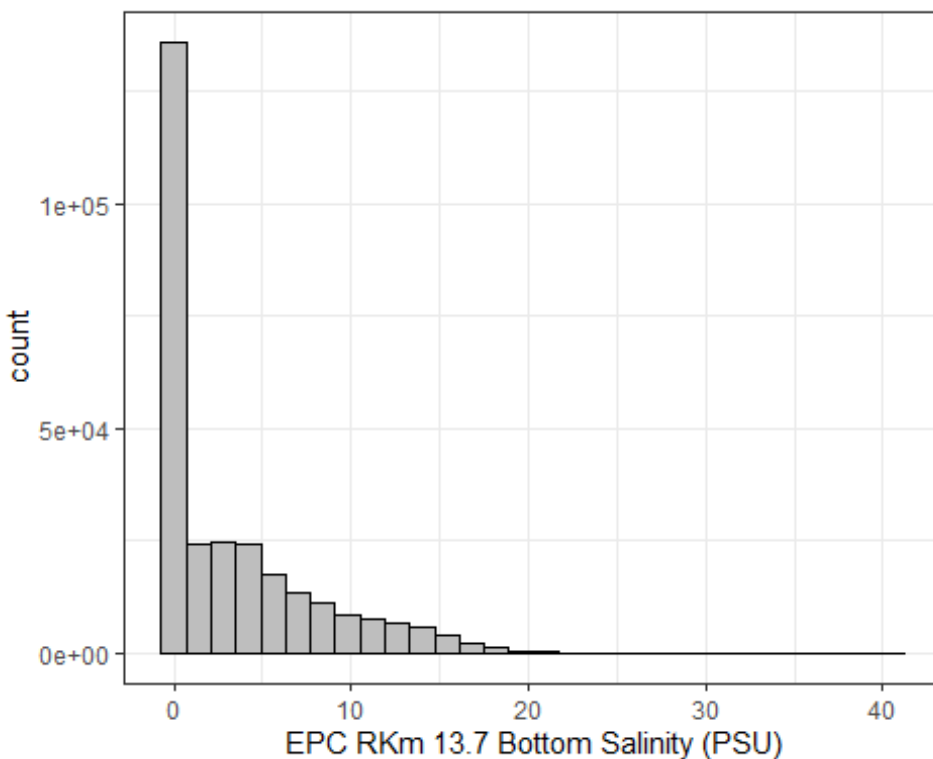
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	9.73	21.39	25.02	24.29	27.75	32.76	168452



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	2.64	4.75	4.50	6.11	16.56	170261



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0	264	2180	5948	9710	60800	168456



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	0.13	1.09	3.41	5.41	40.59	168457

### Southwest Florida Water Management District Continuous Recorder Data

The District has deployed and maintained continuous recorders in Blue Sink and the LHR to monitor various water quality parameters . These data were provided by the District and are described below.

#### CR 19206 Hillsborough River @ Sulphur Springs

##### Filename and path: /WMD/Continuous\_SN\_19206

Metadata: This data was downloaded from the Environmental Data Portal. This is hourly water quality data collect by the District at station number 19206. Each parameter contains its own separate file.

Dissolved Oxygen - TSDData\_SID19206\_District\_Hour\_DO.csv

pH - TSDData\_SID19206\_District\_Hour\_pH.csv

Salinity - TSDData\_SID19206\_District\_Hour\_Salinity.csv

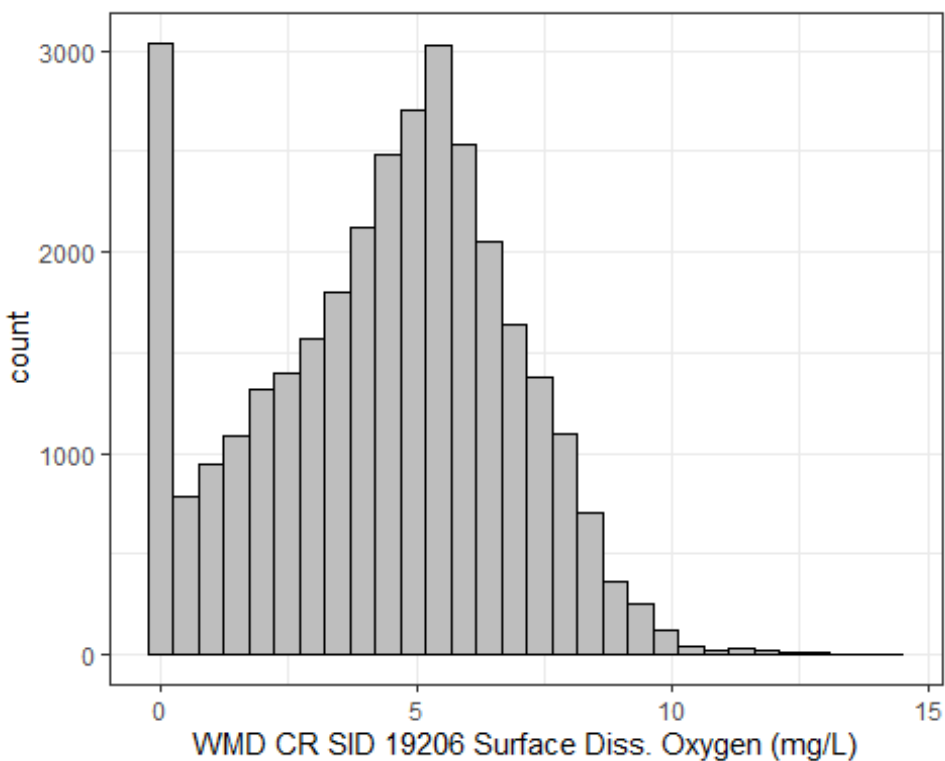
Specific Conductance - TSDData\_SID19206\_District\_Hour\_SC.csv

Turbidity - TSDData\_SID19206\_District\_Hour\_Turbidity.csv

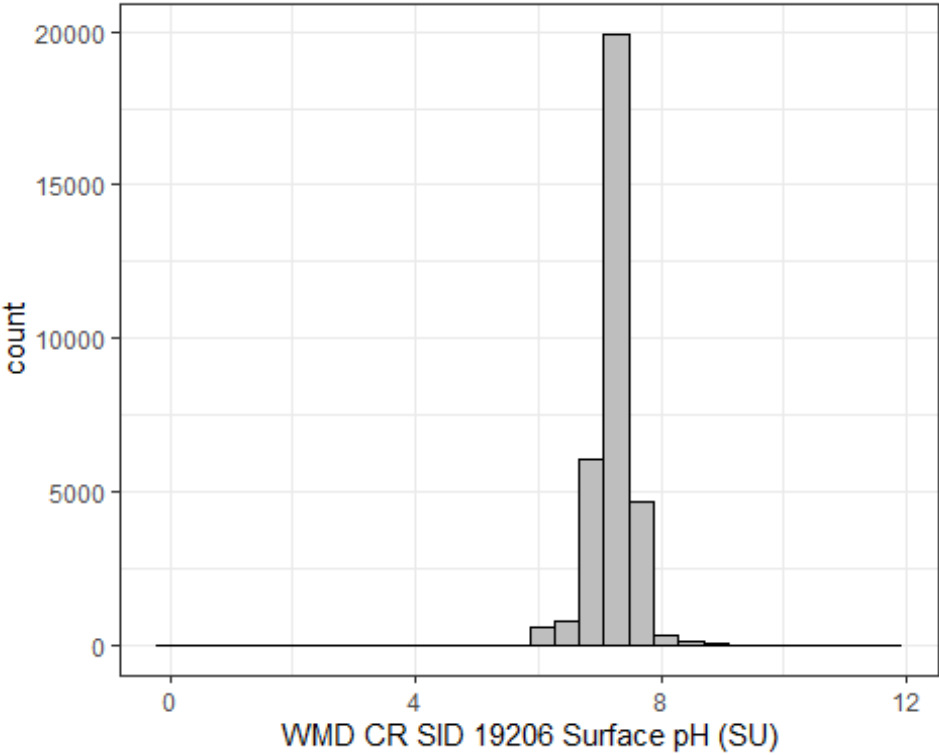
Water Temperature - TSDData\_SID19206\_District\_Hour\_WTemp.csv

Qualifier Codes are defined as:

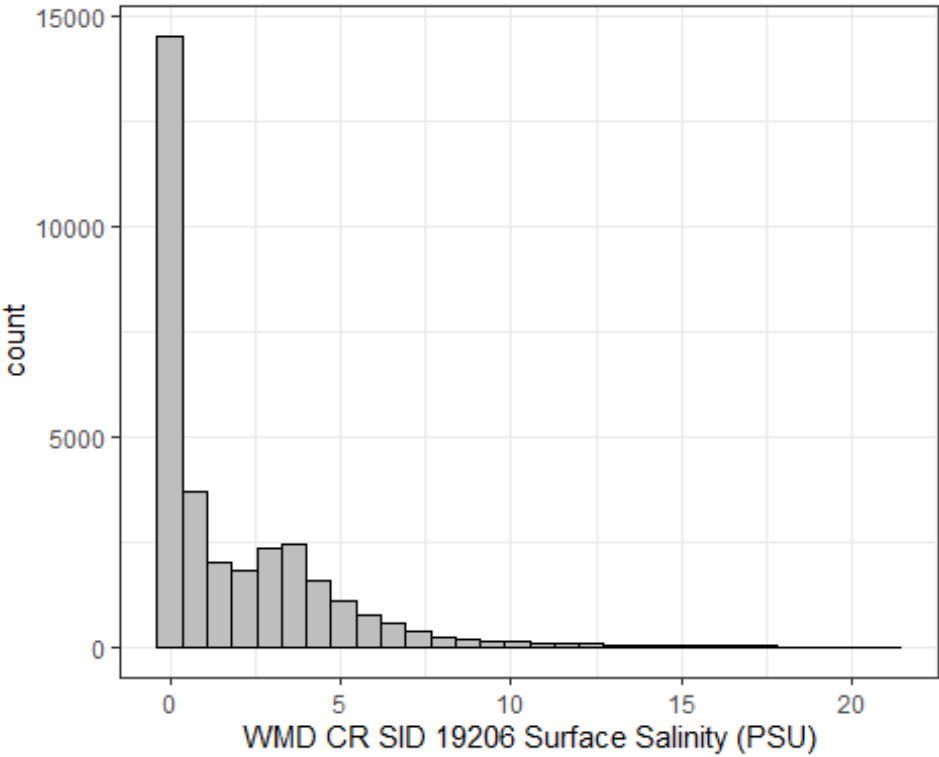
-1 = No code supplied 1 = Good Quality Data 26 = Good Daily Read Records 95 = Estimated  
140 = Data Unchecked



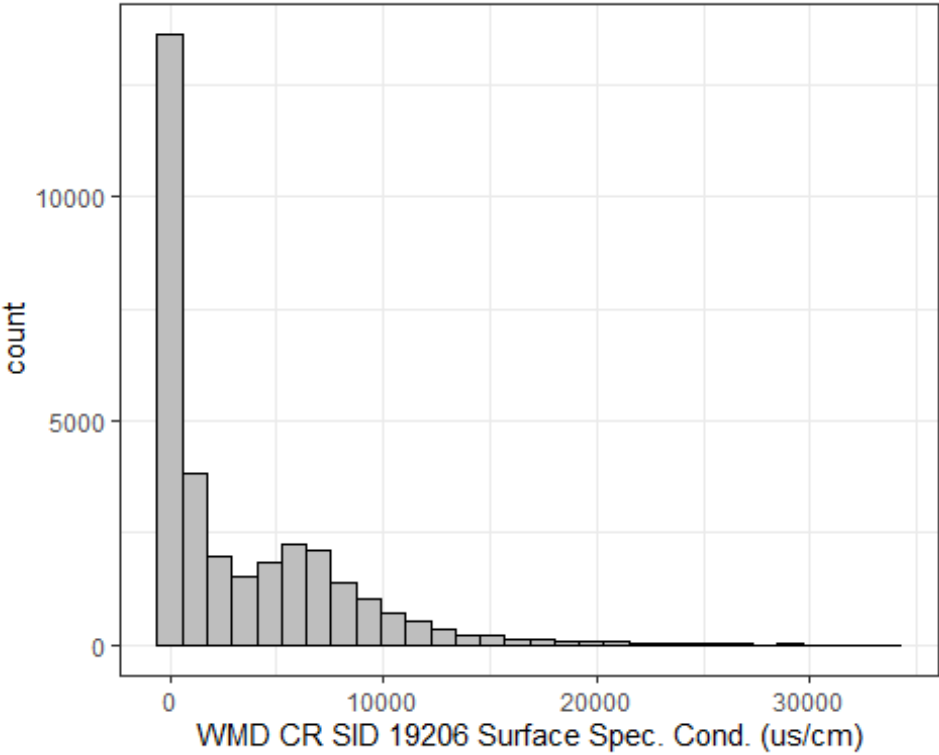
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-0.120	2.580	4.630	4.353	6.070	14.190	179
##	[1]	"-1"	"1"	"140"	"95"		



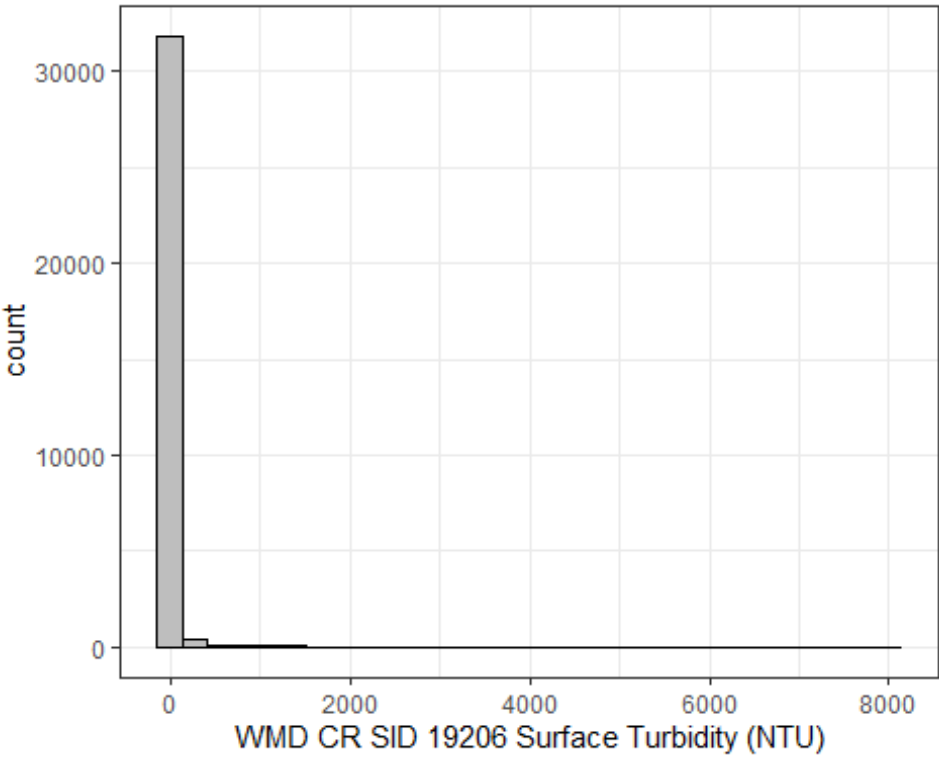
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	7.10	7.27	7.24	7.41	11.72	180
##	[1]	"-1"	"1"	"140"	"95"		



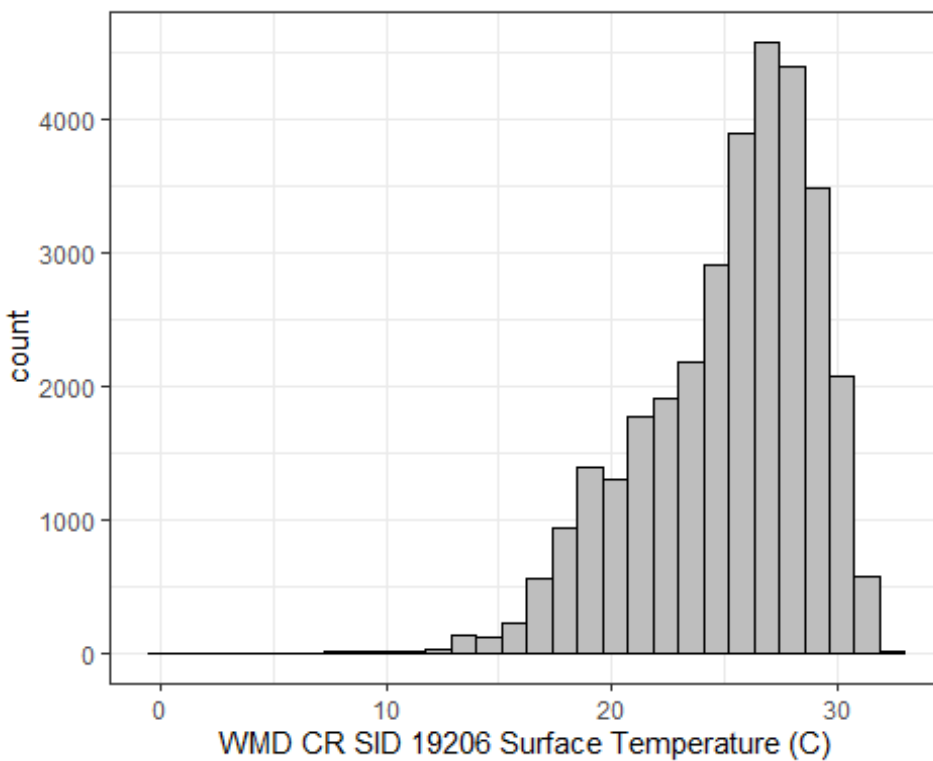
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.000	0.140	0.620	1.977	3.270	21.100	179
##	[1]	"-1"	"1"	"140"	"95"		



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-0.04	300.32	1256.80	3577.40	6036.44	33711.32	179
##	[1]	"-1"	"1"	"140"	"26"	"95"	



##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	-4.13	-1.26	-0.18	16.20	1.35	7999.00	179
##	[1]	"-1"	"140"	"95"			



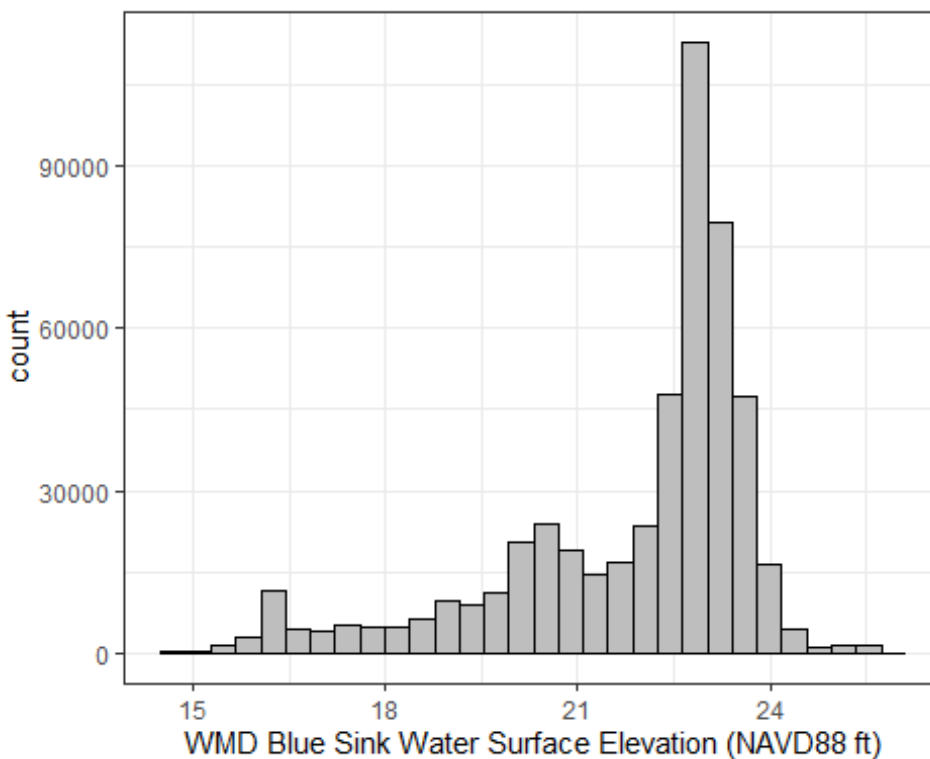
##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	NA's
##	0.00	22.74	25.95	25.15	27.95	32.44	179
## [1]	"-1"	"1"	"140"	"95"			

### Blue Sink Water Surface Elevation

#### Filename and path:

[WMD/BlueSink\\_SN\\_670721/z\\_Other/WMD\\_BlueSink\\_SN670721\\_NAVD88\\_WL.xlsx](#)

Metadata: The District maintains is a single continuous (15 minute) water surface elevation recorder in Blue Sink, station number 670721. Data was downloaded from the Environmental Data Portal. Summary statistics for parameters are summarized below based on the period of record of December 10, 2007 to December 31, 2023



```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  14.68  20.83   22.69   21.87  23.11   25.90   58331
## [1] "1" "2"
```

## Combine and Export Master Dataset

### Filename: LHR\_CR\_Master

Final Master Continuous Recorder dataset is exported as an R dataset and as a comma separated text file by source due to the large file size.

Descriptive statistics (median and interquartile range) are provided for each variable below. The term “unknown” refers to missing values.

```
## Input object size:    2485107296 bytes;   36 variables    8750335
observations
## New object size: 2450122488 bytes;   36 variables    8750335 observations
```

Variables labels are embedded in Rfile and are as follows:

dateTime = “Timestamp”,

Flow\_Inst = “Flow or Pumpage in cfs”,

GH\_Inst = “Gage Height (ft)”,

GH\_Inst\_cd = “Gage Height Quality Code”,

## DRAFT

Hour = "Hour Time",  
TOP\_Wtemp\_Inst = "Surface Water Temperature (C)",  
TOP\_Wtemp\_Inst\_cd = "Surface Water Temperature Code",  
TOP\_SpecCond\_Inst = "Surface Specific Conductance (us/cm)",  
BOTTOM\_SpecCond\_Inst = "Bottom Specific Conductance (us/cm)",  
BOTTOM\_SpecCond\_Inst\_cd = "Bottom Specific Conductance Code",  
BOTTOM\_DO\_Inst = "Bottom Dissolved Oxygen (mg/L)",  
TOP\_DO\_Inst\_cd = "Surface Dissolved Oxygen Code",  
agency\_cd = "Agency Code",  
Flow\_Inst\_cd = "Flow Quality Code",  
tz\_cd = "Time Zone",  
StationName = "Station Name",  
BOTTOM\_Wtemp\_Inst = "Bottom Water Temperature (C)",  
TOP\_SpecCond\_Inst\_cd = "Surface Specific Conductance Code",  
Top\_Sal = "Surface Salinity (PSU)",  
BOTTOM\_DO\_Inst\_cd = "Bottom Dissolved Oxygen Code",  
MIDDLE\_Wtemp\_Inst = "Middle Water Temperature (C)",  
site\_no = "Site Number",  
Date = "Date",  
BOTTOM\_Wtemp\_Inst\_cd = "Bottom Water Temperature Code",  
Bot\_Sal = "Bottom Salinity (PSU)",  
TOP\_DO\_Inst = "Surface Dissolved Oxygen (mg/L)",  
MIDDLE\_Wtemp\_Inst\_cd = "Midwater Water Temperature Code",  
MIDDLE\_SpecCond\_Inst = "Midwater Specific Conductance (us/cm)",  
MIDDLE\_SpecCond\_Inst\_cd = "Midwater Specific Conductance Code",  
TOP\_Turbidity\_Inst = "Surface Turbidity (NTU)",  
WSE\_NAVD88\_ft = "Water Surface Elevation relative to NAVD88" )