

How to Backfill Data into HydroSphere™

Every once in a while, things happen in the field that cause transmissions to cease but data will still be collected by some sensor or data logger. Perhaps the cellular network was not available after a large storm, the modem needed reset, or the data logger was not working but individual sensors were still recording data internally. We would have a gap in the data in HydroSphere but we do have the data available - how do we get it into HydroSphere to maintain the continuity of our dataset? The solution is to use the "Backfill" tool.

Data Input Preparation

Before the data file can be ingested by HydroSphere, some particular steps need to take place.

- 1 Regardless of the data file type (EXO, Amazon, data logger, etc.), a header needs to be input into Row 1 of the data logger or sensor .csv file that is to be uploaded into HydroSphere. The text in cell A1 can be anything; it simply needs to contain text that is not the column names.
- 2 The columns of the data file need to match all of the columns in HydroSphere exactly. For example, if the columns in HydroSphere have information from an Amazon water level sensor, EXO multiparameter sonde, meteorology sensor, and battery, the file that is being input to HydroSphere needs to have all of the same columns. It cannot be a file with just the EXO sonde data, for example. The columns need to be in the same order and the spelling of each header is case sensitive, so take care to manipulate your file and type correctly.

HydroSphere									
Date	Time	EXO2(Nitrate)	EXO2(Wiper_position_V)	EXO2(BGAPC_RFU)	EXO2(Chlorophyll_RFU)	EXO2(Turbidity_FNU)	Battery	Temp	Humidity
2020-04-01	00:00:00			0.17	0.16		7.5		
2020-04-01	00:15:00			0.16	0.16		7.5		

Headers in HydroSphere

	A	B	C	D	E	F	G	H	I
1	WaterLOG Storm Log File - SiteID: TanyardBr1 Serial#: dotbob Firmware: v1.4.8								
2	Date	Time	Amazon(S Stage_M(EXO2(Terr	EXO2(spC	EXO2(Turk	EXO2(Chlc	EXO2(BGA	
3	4/1/2020	15:15:00	2.08	0.63	17.28	245.12	6.74	0.07	0.2
4	4/1/2020	15:30:00	2.04	0.63	17.19	238.84	3.56	0.09	0.26

Headers in Excel .csv file from Storm3 file



As we can see, the headers are not in the proper order, so columns will need to be switched. Be careful to not just switch the column header, but move the data that goes along with it as well. As seen in the next image, the column headers in the .csv file and in HydroSphere will match in order and in case.

	A	B	C	D	E	F	G	H	I
1	WaterLOG Storm Log File - SiteID: TanyardBr1 Serial#: dotbob Firmware: v1.4.8								
2	Date	Time	EXO2(Nitr	EXO2(Wip	EXO2(BGA	EXO2(Chlc	EXO2(Turt	EXO2(ODC	EXO2(ODC
3	4/1/2020	15:15:00	0.37	1.43	0.2	0.07	6.74	91.05	8.74
4	4/1/2020	15:30:00	0.49	1.44	0.26	0.09	3.56	91.19	8.77

Manipulated .csv file

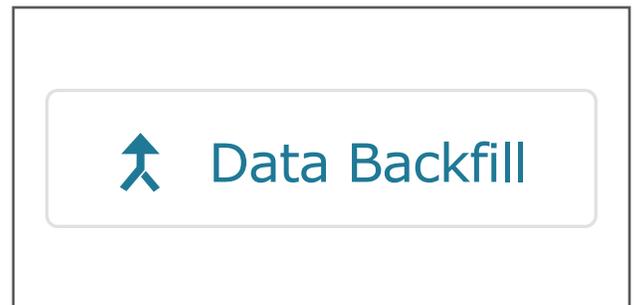
NOTE: If the file is coming from a single sensor and multiple sensors are at the site, the other sensor data needs to be included in the single sensor file to be backfilled. Blank data will translate to HydroSphere as being removed and changing or removing data is irreversible. For example, if Amazon data is being pasted in and EXO columns are left blank, all EXO data in HydroSphere will be removed.

HydroSphere Backfill Tool

Once the data file has been prepared as shown above, it is ready to be input into HydroSphere to fill any gaps in data.

- 1 In HydroSphere, navigate to the site that needs data to be pasted in and from the site page, click on the Data Backfill button in the top right corner.

Clicking on this button will direct you to the page's backfill utility. Each individual site needs to have this button clicked from its own page. For example, if a user wants to backfill into site Creek1, they need to be on the Creek1 page - they cannot fill in data from the River1 page.



Data Backfill Button

- 2 Enter a From and To date in the fields at the top of the page. A user can backfill up to 90 days in one operation. If greater than 90 days is to be filled in, perform the operation on the first 90 days and then the next batch of 90 days and so forth.

From date * 4/1/2020 To date * 4/15/2020 Go

Date range entry fields

- 3 After dates are selected and the Go button is clicked, HydroSphere will pull all of the available data from the period and show it in the panel on the left side of the screen.

HydroSphere							Data file from Data Source	
Date	Time	EXO2(Nitrate)	EXO2(Wiper_position_V)	EXO2(BGAPC_RFU)	EXO2(Chlorophyll_RFU)	EXO2(Turbidity_FNU)		
2020-04-01	00:00:00		0.17	0.16				
2020-04-01	00:15:00		0.16	0.16				
2020-04-01	00:30:00		0.18	0.16				

HydroSphere Data

As can be seen, the bar on the very left of the screen is completely orange. This is because HydroSphere assumes that the data file is complete with no gaps. Once the data file is input from the data source, the orange bar will show some red portions which indicate where data is missing.

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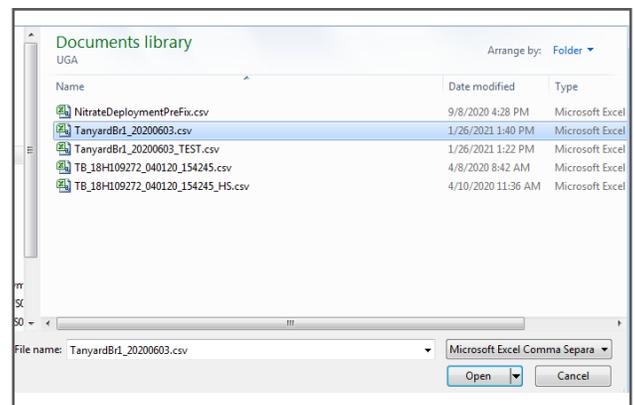
To input data from the data source that was manipulated in the previous step, click on the Browse link in the center of the Data File from Data Source pane.



Data file from Data Source pane

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After clicking the browse button, a file navigation box will appear. Navigate to the file that needs to be uploaded and click Open.



File upload navigation pane

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Once the file is loaded, the data from the loaded file will appear in the right hand pane and the colored bar on the far left of the screen will turn color to red to indicate where there are gaps in current HydroSphere data. The snippet below shows an example of how the data will appear.



HydroSphere Data file from Data Source Upload

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The next step is to backfill lines of missing data. There are three options for this and the arrows between the panes of data indicate which operation is to be performed:

- Fill in a single line of data (single arrow)
- Fill in a single gap of data (double arrow)
- Fill in all gaps of data (triple arrow)



Data gap indicators

To fill in a single line of data, click on the line of data in the right hand data panel and then click the single arrow button.

To fill in a gap of data, select the red colored gap on the colored bar on the left side of the screen and click the double arrow button.

To fill in all of the data, no data needs to be selected. Simply click the triple arrow button.

After an operation has been selected, HydroSphere will paste the data from the data file into the HydroSphere file and the data file's data will appear in the HydroSphere data side.

Finally, click the Backfill button. The green loading bar will run across the top of the screen and a message will appear saying that data has been backfilled successfully.

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Once all of these steps have been completed, it is important to ensure that the data has been successfully pasted in as intended. Navigate back to the chart view of the site and go to the date range that has just been backfilled. Simply viewing the data will give you a visual knowledge that the data record is now complete for the period for all parameters that have been loaded in.

Please feel free to reach out to our technical support team at info@ysi.com if you have any questions about this or other HydroSphere functionality.

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