

CENTRAL REGION TECHNICAL ATTACHMENT 94-06

THE HYDRO SPREADSHEET SERIES¹

Ver. 2.0

January 14, 1993

Jerry T. Bush
National Weather Service Office
Lander, Wyoming

1. INTRODUCTION

This series of spreadsheets was developed as an aid to plotting and tracking river gage and snotel site readings. It was developed as an alternative to the RIVER program (Baker and Little, 1989) used on the National Weather Service AFOS computer network. While the river program runs quite well at a WSFO, the average WSO single computer AFOS is not adequate to run this program. This has resulted in WSOs being dependent on their parent WSFOs to provide computer generated graphic plots of river gage readings. There remains a need for WSOs to have real-time graphic views of river gage changes and snotel data for their areas of responsibility.

The increasing availability of both personal computers and spreadsheet programs in the WSOs, has provided the opportunity for uniform program development. While the HYDRO.WQ1 spreadsheet series was developed for use in a WSO, it could be used at any NWS office with a PC and Quattro Pro. RVRGAGE.WQ1 was written for use with Quattro Pro, version 4.0, but could be adapted to other spreadsheet programs as well. It is entirely macro oriented and was designed to be user-friendly, even to a person who is unfamiliar with spreadsheets.

There are advantages of using a spreadsheet for this type of application, rather than a stand-alone "generic" program. A primary advantage is the ability of each office to modify the spreadsheet to their unique needs.

2. INSTALLATION AND SETUP

The HYDRO series of spreadsheets requires specific directories to exist with specific data files in each directory. This is necessary for the macros to run properly. The directory hierarchy is as follows:

¹ Software available upon request from Central Region Scientific Services Division.

C:\QPRO	Contains AHYDRO.WQ1 Contains ASNOTEL.WQ1
C:\QPRO\HYDRO	Contains RVRGRAPH.WQ1 SNOTEL.WQ1
C:\QPRO\HYDRO\RVR	Contains JAN-DEC.WQ1 (River data files)
C:\QPRO\HYDRO\SNW	Contains BASIN1-3.WQ1(Snotel data files) B_1-3SUM.WQ1(Basin summary files)

The individual files should be copied to the appropriate directories. This can be done manually or by using the included batch files INSTALL.bat and INSTALL2.bat.

3. OVERVIEW

Start Quattro Pro, then load the AHYDRO.WQ1 file from the main Quattro Pro directory. An auto-execute macro will change to the necessary directory and load the RVRGRAPH.WQ1 spreadsheet. When the spreadsheet is loaded, the user will be asked "DO YOU WANT TO LOAD A MONTHLY DATA FILE NOW? Y/N...". Respond with either a Y or N. (Please note...the Caps Lock key was automatically set to Caps when the program loaded.) A "Y" response will result in another prompt asking the user to enter the name of the file (or month) the user wants to edit or view. Respond with the first three letters of the month name, i.e. JAN, JUL, AUG, etc. That file will then load into the current worksheet. Next the main menu will appear in the upper left hand corner of the screen. This menu gives the user several options for viewing, updating, and printing of the river gage data. When the user is through with the river gage data, choose either the SNOTEL or EXIT option from the main menu. All data files will be saved and the spreadsheet will execute the appropriate action.

When used for the first time, the gage location, name and flood stage should be entered. This is done with the GAGE INFO option on the menu. Using the keyboard arrow keys, highlight GAGE INFO and hit enter. (Note, a mouse can also be used if your system is so equipped.) The cursor will move to the appropriate location in the spreadsheet and you can begin entering the information. If you do not have any information to type, just hit [ENTER] until you reach the end of the gage data and you will return to the menu.

When entering the gage information there are a couple of things to keep in mind. This information should be complete, yet as brief as possible. This is especially true for the location entry. If too long, it will not show completely in the cell (not real important). This same information will also show as the label for the corresponding graph. If too long, the graph title will become cluttered. Any of these entries can be changed at any time, so you may want to experiment a little. It is strongly recommended that you enter the five digit Shef ID for the gage ID. Enter flood stage at the gage site if known.

4. THE MENU SYSTEM

Detailed information on each of the main menu options will follow.

VIEW - The VIEW option from the main menu is used for viewing the graphed gage data. From View, a sub-menu is displayed with three options given. Individual graphs can also be printed after viewing. VIEW options are:

RETURN TO MENU: Returns you to the main menu. No graph viewing is done.

WEEK: The week option allows the user to view a graph of the gage readings for the past 7 days. When prompted, type the first three letters of the graph ID to view the graph (they will be displayed). After viewing a graph, hit any key to continue. You will be asked if you want to print the graph at this time. Make sure your printer is set and ready to print. NOTE: Printing graphs is a rather slow process. The time required to print a graph depends on the printer plotting density, your printer type, and whether you print graphs in draft or final mode. See the Quattro Pro User's Guide for more details.

MONTH: The month option allows the user to view a graph of the gage readings for the entire month. When prompted, type the first three letters of the graph ID to view the graph (they will be displayed). After viewing a graph, hit any key to continue. You will be asked if you want to print the graph at this time. Make sure your printer is set and ready to print.

SLIDE SHOW: The slide option is slightly different. This option will allow you to see a slide show, on screen, of either the week graphs or the month graphs. A sub-menu will appear:

UPDATE - Most gage readings are taken every six hours and transmitted over AFOS, this is the information expected for use in this spreadsheet. The data must be entered manually as it becomes available. River gage readings are entered using the UPDATE option from the main menu. Highlight UPDATE and hit ENTER. You will go to the first available empty cell for data entry. Enter the day of the reading, next to the appropriate time, UTC. (See alternate below.) If any gage data is not available just hit return. The graphs will not plot a data value if the cell is empty. However, most spreadsheet programs, including Quattro PRO, will plot a 0 (zero), value for a non-numeric entry.

Note: A RETURN must be used after each piece of data is entered. DO NOT use the arrow keys to move between data entries. The "NumLock" has been set so the numeric key pad can be used to speed up data entry.

...ALTERNATE (DATA ENTRY).. - Instead of using the UPDATE option from the main menu, choose QUIT MENU. Using the arrow keys, move the cursor to the cell you want to begin data entry. The data cells begin at location A14. Enter the day and gage

readings in the appropriate cells. When you are through with data entry, hit ALT-M (hold down the ALT key and press M) to return to the main menu.

Note: you can use QUIT MENU at any time to make other changes to the spreadsheet, Just hit ALT-M to return to the menu. The spreadsheet comes with the global protection enabled. Before you can make any changes to a non-highlighted cell (highlighted cells are not protected), you must first disable the protection mode. This is done with the Quattro Pro options menu. See your user's guide for more information.

FILES - The raw gage data is stored in monthly files for the set of gages. Before you can enter data into these files you must first load them into the RVRGRAPH spreadsheet. This is done with the FILES option from the menu. Select FILES then hit ENTER. Another menu will give you four options. They are:

RETURN TO MENU: Returns you to the main menu. No file action is taken.

SAVE: Saves the active data file. You MUST FIRST have one loaded.

LOAD: Retrieves a monthly data file. You supply the name of the file to retrieve. The file names are the first three letters of each month, i.e. JAN, APR, JUL, etc.

CLEAR: Clears the data section from the RVRGRAPH spreadsheet. The data files are not affected by this command, other than the current data is not saved.

PRINT - The print option allows you to print the raw gage data, weekly graphs or monthly graphs. Make sure your printer is on line and ready to print.

RETURN TO MENU: Return you to the main menu.

RAW DATA: Prints the raw data as entered in the spreadsheet.

WEEK GRAPHS: Prints the last set of weekly graphs created with VIEW, WEEK option (Figure 1).

MONTH GRAPHS: Prints the set of monthly graphs. These are the same graphs as seen with the VIEW, SLIDE SHOW option.

GAGE INFO - This option allows the user to input river gage information. Suggested information would be the gage name or location, the Shef ID, and the flood stage (if known). This information will also appear on the associated graph.

SNOTEL - This option will switch from the RVRGRAPH spreadsheet to the SNOTEL spreadsheet. The RVRGRAPH spreadsheet is automatically cleared and saved before the SNOTEL spreadsheet is loaded.

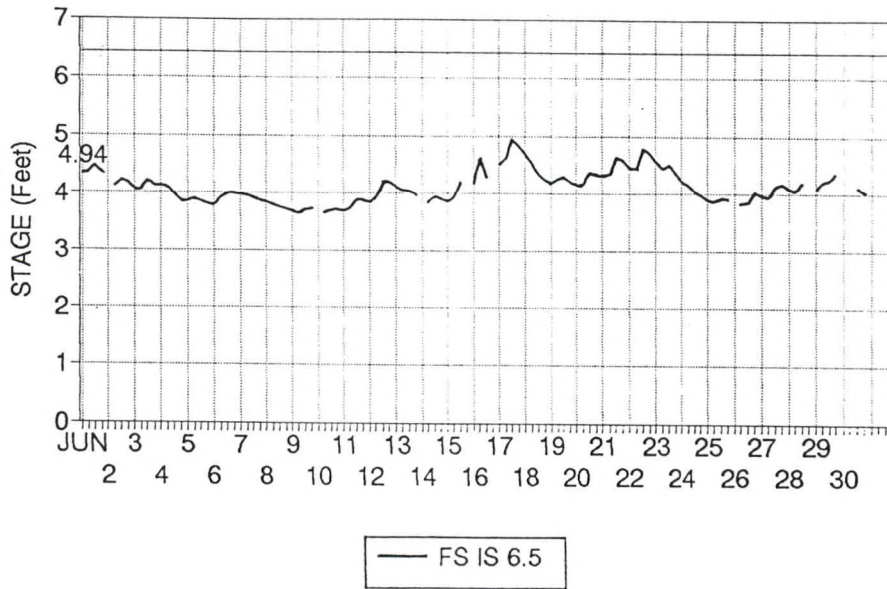


Figure 1. Example of a Weekly Graph of River Stages for Popo Agie @ Lander (LANW4).

The SNOTEL spreadsheet looks and operates almost exactly like the RVRGRAPH spreadsheet. The difference is the data files are saved by basin instead of by month. The SNOTEL spreadsheet comes with three basin files, BASIN_1.WQ1, BASIN_2.WQ1, and BASIN_3.WQ1. Data for a single season would be stored in each file for a particular basin. A basin file must first be loaded into the spreadsheet before data can be entered. When the Year graphs (Figure 2) are printed, a basin summary is also printed (Figure 3). Otherwise, graph viewing and printing is exactly as it is in the RVRGRAPH spreadsheet.

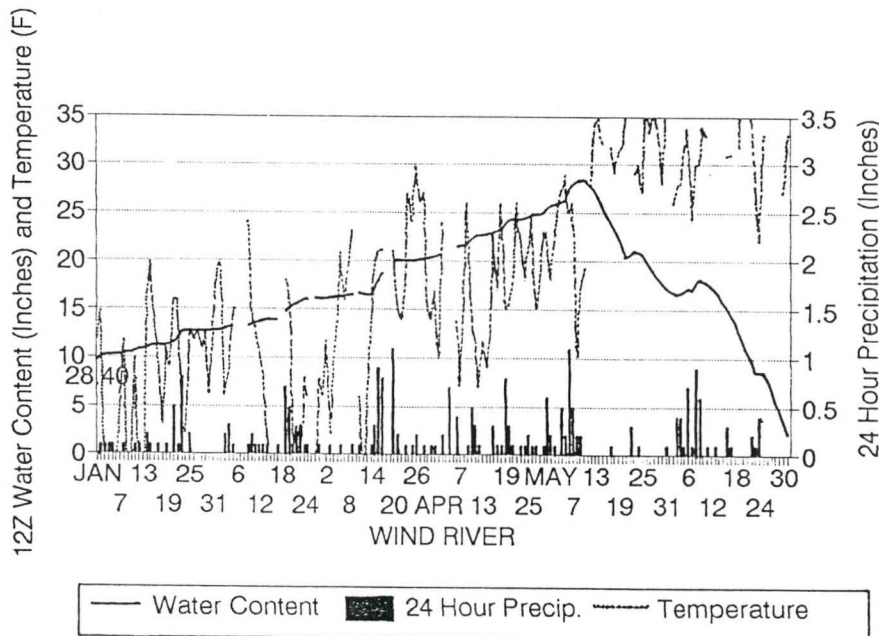


Figure 2. Example of an Annual Graph of Water Content, 24-hour Precipitation and Temperature for Togwotee Pass (TOGW4).

WIND RIVER BASIN SUMMARY

JANUARY 14, 1994

JANUARY	CONTENT		24-HR PCPN			7 AM TEMP		FEBRUARY	CONTENT		24-HR PCPN			7 AM TEMP		
	MAX	MIN	AVG	MAX	TOT	MAX	MIN		MAX	MIN	AVG	MAX	TOT	MAX	MIN	
TOGWOTEE PASS	12.9	9.8	11.4	0.8	2.8	20	-8	TOGWOTEE PASS	16.2	12.9	14.3	0.7	3.5	24	-19	
BURROUGHS CREEK	6.7	0.0	5.3	0.4	1.9	24	-6	BURROUGHS CREEK	8.4	6.6	7.3	0.8	2.1	24	-20	
LITTLE WARM	3.9	2.2	2.9	0.4	1.8	22	-12	LITTLE WARM	7.2	2.7	6.1	0.4	1.5	21	-23	
ST. LAWRENCE ALT	4.4	3.3	4.0	0.2	1.0	26	-10	ST. LAWRENCE ALT	5.0	4.3	4.6	0.1	0.3	26	-24	
HOBBS PARK	8.7	6.5	7.8	0.2	1.6	29	-11	HOBBS PARK	10.2	8.7	9.3	0.5	2.1	23	-24	
TOWNSEND CREEK	6.5	4.9	5.7	0.2	1.5	3	-14	TOWNSEND CREEK	7.1	5.8	6.5	0.3	1.1	28	-29	
CHRISTINA	6.5	4.5	5.9	0.4	2.8	29	-7	CHRISTINA	8.4	6.4	7.1	0.5	1.8	26	-18	
BASIN AVERAGE	7.1	4.5	6.1	0.4	1.9	26	-10	BASIN AVERAGE	8.9	6.8	7.9	0.5	1.8	25	-22	
						TOT	13.4								TOT	12.4

MARCH	CONTENT		24-HR PCPN			7 AM TEMP		APRIL	CONTENT		24-HR PCPN			7 AM TEMP		
	MAX	MIN	AVG	MAX	TOT	MAX	MIN		MAX	MIN	AVG	MAX	TOT	MAX	MIN	
TOGWOTEE PASS	20.4	16.2	18.2	1.1	4.5	30	-13	TOGWOTEE PASS	25.4	20.6	23.1	0.8	5.3	26	7	
BURROUGHS CREEK	11.9	8.4	10.1	0.8	4.2	34	-16	BURROUGHS CREEK	13.8	11.9	13.1	0.5	1.9	30	6	
LITTLE WARM	9.4	7.1	8.2	0.3	2.4	28	-17	LITTLE WARM	11.3	9.5	10.6	0.3	2.0	30	-1	
ST. LAWRENCE ALT	6.2	5.0	5.4	0.2	0.9	38	-13	ST. LAWRENCE ALT	7.4	5.9	6.7	0.6	3.1	32	6	
HOBBS PARK	13.4	10.2	11.3	0.4	2.3	34	-11	HOBBS PARK	16.5	13.3	15.4	0.5	3.3	30	1	
TOWNSEND CREEK	9.1	6.9	7.6	0.3	1.6	34	-16	TOWNSEND CREEK	10.6	8.8	9.9	0.5	2.7	31	1	
CHRISTINA	10.2	8.4	9.0	0.4	2.2	32	-11	CHRISTINA	13.6	10.3	12.1	0.6	3.9	37	5	
BASIN AVERAGE	11.5	8.9	10.0	0.5	2.6	33	-14	BASIN AVERAGE	14.1	11.5	13.0	0.5	3.2	31	4	
						TOT	18.1								TOT	22.2

MAY	CONTENT		24-HR PCPN			7 AM TEMP		JUNE	CONTENT		24-HR PCPN			7 AM TEMP		
	MAX	MIN	AVG	MAX	TOT	MAX	MIN		MAX	MIN	AVG	MAX	TOT	MAX	MIN	
TOGWOTEE PASS	28.4	17.3	23.7	1.1	3.6	41	10	TOGWOTEE PASS	18.2	0.0	11.2	20.8	86.1	40	6	
BURROUGHS CREEK	14.2	0.1	8.4	1.1	3.3	40	15	BURROUGHS CREEK	9.2	0.0	1.0	6.2	27.3	39	8	
LITTLE WARM	11.4	1.0	6.2	1.2	3.1	37	12	LITTLE WARM	8.0	0.8	1.8	12.7	55.4	37	25	
ST. LAWRENCE ALT	6.6	0.0	2.6	1.3	5.8	40	13	ST. LAWRENCE ALT	1.0	0.0	0.1	1.0	6.8	42	27	
HOBBS PARK	19.3	6.0	15.0	1.0	4.0	39	6	HOBBS PARK	5.6	0.2	2.3	1.1	6.6	42	21	
TOWNSEND CREEK	10.0	0.0	4.8	0.8	3.9	44	16	TOWNSEND CREEK	1.2	0.0	0.1	0.8	3.0	43	26	
CHRISTINA	16.0	5.4	12.5	0.9	4.4	43	13	CHRISTINA	4.4	0.0	1.4	0.6	4.1	44	26	
BASIN AVERAGE	15.1	4.3	10.5	1.1	4.0	41	12	BASIN AVERAGE	6.8	0.1	2.6	6.2	27.0	41	20	
						TOT	28.1								TOT	189.3

SEASON	CONTENT		24-HR PCPN			7 AM TEMP	
	MAX	MIN	AVG	MAX	TOT	MAX	MIN
TOGWOTEE PASS	28.4	3.5	17.4	24.2	41	-19	13
BURROUGHS CREEK	14.2	0.0	7.6	16.9	40	-20	15
LITTLE WARM	11.4	0.8	5.7	15.3	37	-23	14
ST. LAWRENCE ALT	7.4	0.0	3.9	17.8	42	-24	16
HOBBS PARK	19.3	0.2	10.2	19.9	42	-24	14
TOWNSEND CREEK	10.6	0.0	5.7	13.8	44	-29	14
CHRISTINA	16.0	0.0	8.0	18.9	44	-18	16
BASIN AVERAGE	5.3	0.6	8.4	18.1	41	-22	15
					TOT		126.9

Figure 3. Example of Seasonal Summary.

QUIT MENU - The quit menu option allows you to exit the main menu, and remain in the spreadsheet. You can move around and view different portions of the spreadsheet, or make changes to the spreadsheet as needed.

NOTE: The global protection has been set to Enable. This means you cannot edit any portion of the spreadsheet, other than highlighted cells. If you wish to edit the spreadsheet or its Macros, you must first disable the protection mode (Alt-D).

EXIT - The Exit option allows you to exit Quattro Pro and return to DOS. When you choose Exit, you are asked if you are sure you want to exit the spreadsheet. A Y, (yes) will automatically save the spreadsheet and return you to DOS. An N, (no) will return you to the main menu of the spreadsheet.

5. REFERENCES

Baker, Samuel, and C. D. Little, 1989: Hydrologic Data Decoding and Plotting Programs (RVR/RVRA). NOAA Eastern Region Computer Programs and Problems ERCP - No. 46, NWS, Garden City, New York.