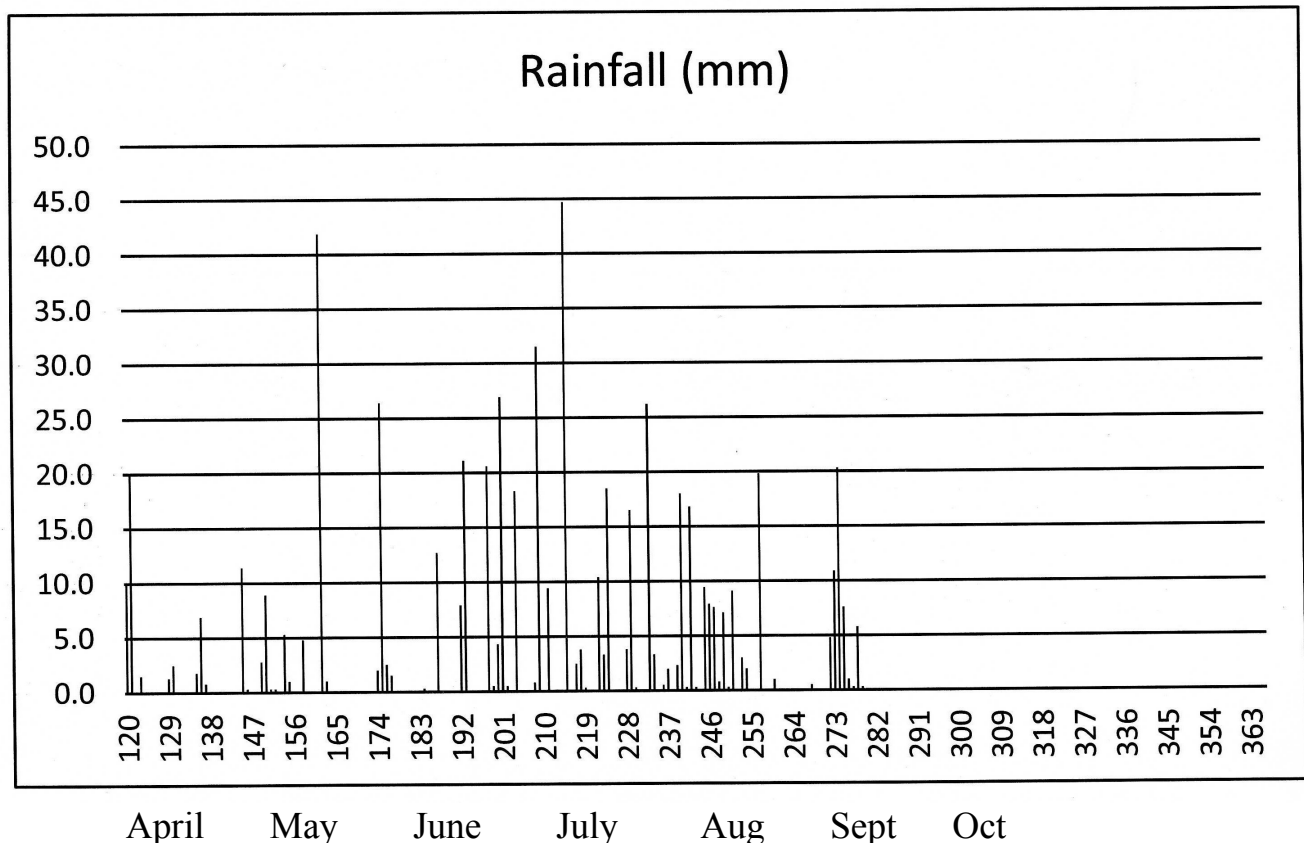


I thought our readers might be interested in a short report on the weather data we collected from our weather station here on Clam Lake during the 2020 April - October period. For those of you who missed the initial article I have repeated some of the information on the equipment we are using. My plan was to use 2020 as a test year to see how well the equipment performed and what changes we would need to make going forward to get reliable data. The reason for this project was that we felt that data from our WQM (Water Quality Monitoring) Program when correlated with reliable local weather data might help explain some of the changes we are seeing in our lakes & rivers and perhaps help predict events like algae blooms.

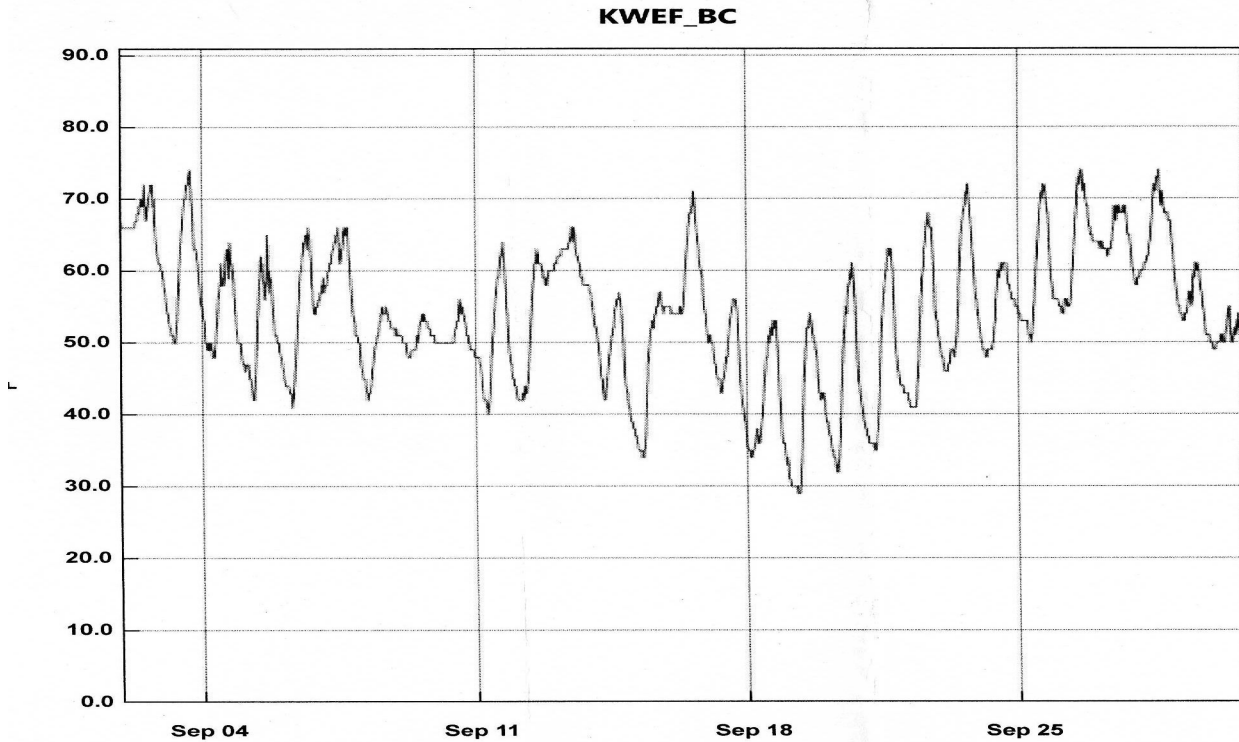
Below is a small sample of the data we collected here on Clam Lake since we started at the end of April 2020. Below is monthly rainfall and average temperature data :

|         |                |                |          |               |
|---------|----------------|----------------|----------|---------------|
| May     | Total rainfall | 38.8mm (1.53") | Avg temp | 11.8C (53.2F) |
| June    |                | 86.4mm (3.40") |          | 17.4C (63.3F) |
| July    |                | 154.8mm(6.09") |          | 21.0C (69.8F) |
| Aug     |                | 173.8mm(6.84") |          | 17.4C (63.3F) |
| Sept    |                | 104.5mm(4.11") |          | 12.2C (53.9F) |
| October |                | 123.3mm(4.85") |          | 5.3C (41.5F)  |

The daily rainfall data which was entered into a spreadsheet has been displayed as a bargraph (below). The x axis numerical labels are days of the year.



The temperature data logger provides the monthly temperature data in a spreadsheet format which can be downloaded into a computer. That data can then be analysed using basic spreadsheet tools / functions such as Max - Min, less than or greater than a specific value plus stats such as mean, average etc . The raw data can also be presented graphically in many ways. I have included below a line graph of the temperature data for the month of September and a printout of a couple of hours of the raw temperature data



| KWEF_BC | Time           | Fahrenheit(°F) | Comments |
|---------|----------------|----------------|----------|
| 4663    | 02/09/20 06:03 | 66             |          |
| 4664    | 02/09/20 06:13 | 66             |          |
| 4665    | 02/09/20 06:23 | 66             |          |
| 4666    | 02/09/20 06:33 | 66             |          |
| 4667    | 02/09/20 06:43 | 66             |          |
| 4668    | 02/09/20 06:53 | 67             |          |
| 4669    | 02/09/20 07:03 | 67             |          |
| 4670    | 02/09/20 07:13 | 67             |          |
| 4671    | 02/09/20 07:23 | 67             |          |
| 4672    | 02/09/20 07:33 | 67             |          |
| 4673    | 02/09/20 07:43 | 67             |          |
| 4674    | 02/09/20 07:53 | 67             |          |
| 4675    | 02/09/20 08:03 | 68             |          |
| 4676    | 02/09/20 08:13 | 68             |          |
| 4677    | 02/09/20 08:23 | 68             |          |
| 4678    | 02/09/20 08:33 | 68             |          |
| 4679    | 02/09/20 08:43 | 68             |          |
| 4680    | 02/09/20 08:53 | 68             |          |

Shown to the right are the various pieces of weather monitoring equipment we are using. The Extech WTH600 Weather Station which is mounted on the tall post measures wind speed and direction, humidity, temperature, barometric pressure and rainfall. The large black LCD display unit, located remotely displays all the above data in real time plus maintains max/min and historical data for the last 24 hours.



The LaCrosse rain gauge & display sitting immediately below the weather vane will measure and record to memory the daily rainfall for a year. The Stratus manual rain gauge on the left side measures rainfall to .01" and was used as backup for the automatic LaCrosse gauge and to check its accuracy.

The temperature data logger is not shown but looks like a large "flash drive" and can record 16000 temperature readings plus a time/date stamp. I have it set to record every ten minutes - which allows it to run unattended for over 3 months, The 2 year battery is replaceable and the unit has a built in USB connector so that it can download data in spreadsheet format to a computer.

Finally the small instrument lying in front of the two LCD displays is a portable pH and Conductivity meter. We use it to measure rainfall pH and to check the pH and conductivity in the stream draining from the graphite mine. Today's miniature measurement & sensor technology is truly amazing.

The instrumentation worked well. To be useful the info from the WTH600 plus lake level and surface water temperatures that are recorded manually must be done each day and I found that the best approach was to do it first thing each morning.

As I had mentioned in the previous article - weather is part of our daily conversation. It affects our lives everyday but its power remains largely beyond our control. Studying & tracking the weather is another way to reconnect with nature and the real world.