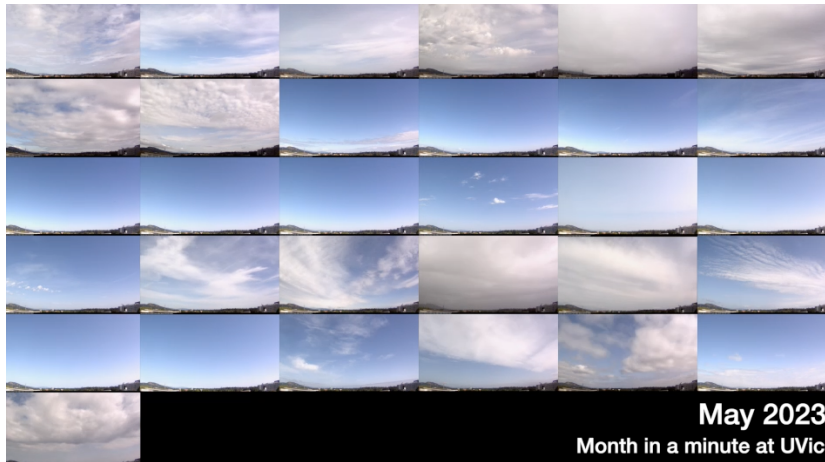*May 2023*

Figure 1: May 2023.

Temperature

The big story of May, 2023 at UVic is the temperature. We observed the warmest May since 2002 (Figs. 2, 3). The monthly average this year was 15.2 °C. This exceeded the previous warmest years (2018, and 2005) by more than 0.5 °C. This is significant given that the previous 10 warmest years are each only separated by one-tenth or a few one-hundreths of a degree celsius. Such departures from experience are more likely now due to the effects of climate change. The ever more rapidly increasing global average temperature is raising the floor for temperature at UVic and the region.
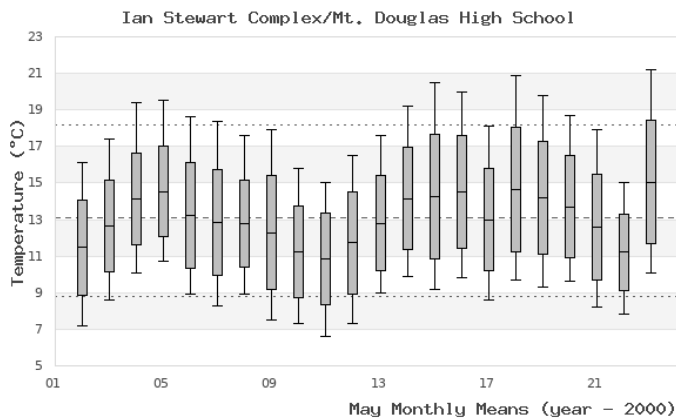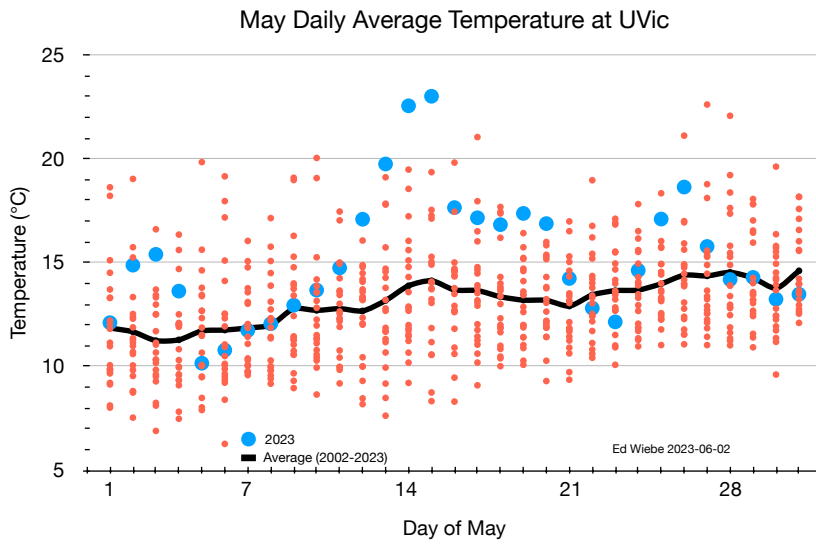

Figure 2: May temperatures.

May Daily Average Temperature at UVic

Figure 3: Daily average temperatures in May at UVic.

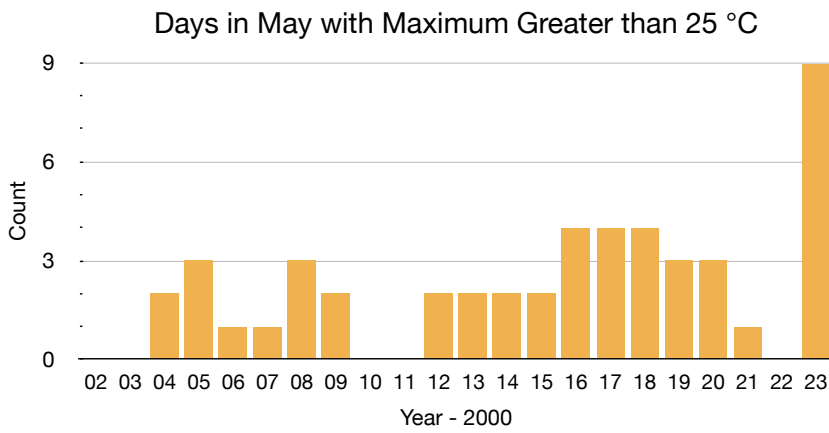## Days in May with Maximum Greater than 25 °C

Figure 4: Days exceeding 25 °C in May.

How unusual this May was is seen in Figure 4. This is a simple count of days in May (since 2002) that have exceeded 25 °C. 2023 had more than twice as many such days.

May is typically a month of increasing daily average temperature (see the heavy black line in Fig, 3). Available solar energy increases as the sun climbs higher in south and the day gets longer. We expect to see new record temperatures at the end of the month.

Figure 5 shows daily temperature range. During the heat event, the range was similar every day, but the daily extremes both increased. Clear skies allowed energy to pour down to the surface from the sun. Nighttime cooling was still strong (clear skies) but each day was a bit warmer and the overnight cooling couldn't radiate all of the heat away. Also, overnight wind is greatly reduced under high pressure systems in the region. That means there was reduced *sensible* heat transfer at night.

Incidentally, the phenomenon of increasing morning low temperatures is widespread globally. Greenhouse gasses added to the atmosphere are increasing the flux of long-wave radiation down to the surface. This is slowly reducing the ability of surfaces to cool as much as they did under lower greenhouse forcing. Gradually, morning lows are increasing.
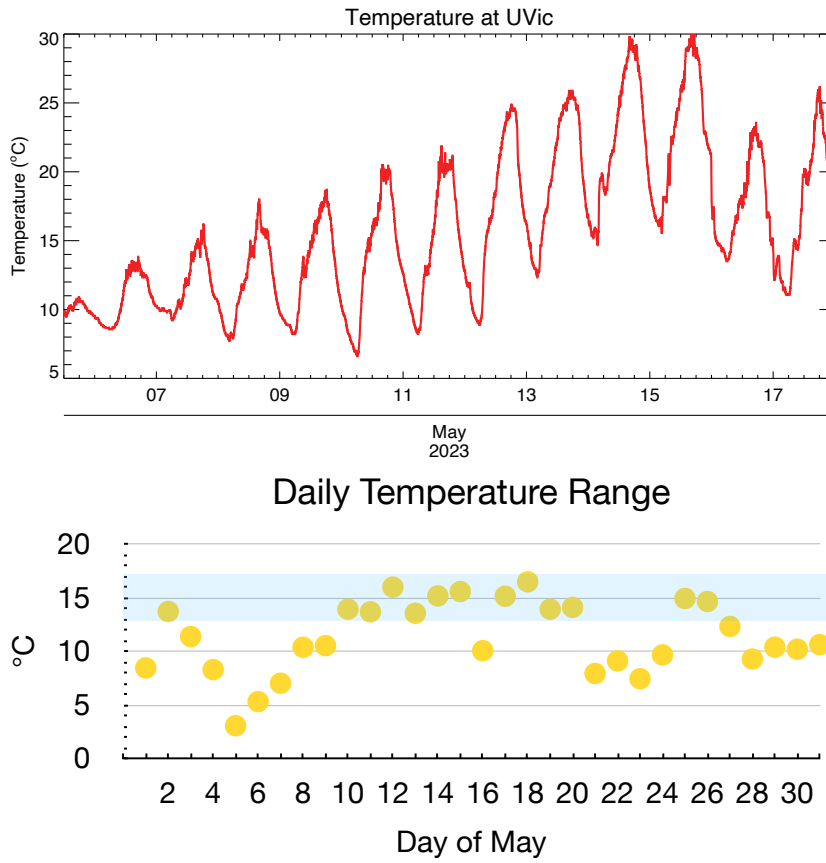
Figure 5: Daily temperature range in May.

Rainfall

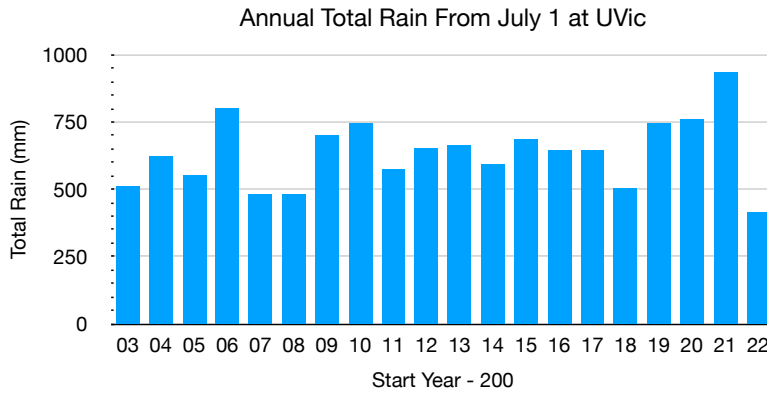See update below...

Annual Total Rain From July 1 at UVic

Figure 6: Annual Total Rain from July to July. 2023 is incomplete.

The story of the year with respect to rain has been that less has been observed than expected. Even this past winter, a time when rain is very reliable, was lower than average. Figure 6 shows the total accumulated annual rain from 1 July through 30 June starting in the indicated year. The past year, indicated with 22 on the right of the horizontal axis, is the smallest total in 22 years. Average total rain in June has been 15 mm during this period. We'd need to receive more than 60 mm this coming June in order to reach the previous lowest values, from 2007 and 2008. The largest June rain we have observed was 35 mm in 2012. It seems possible (though unlikely) that we might see none this year. This is going to have important effects on our local environment. Large red cedars for example have been showing signs of water stress for some years now. The lack of rain this past year means ground water is likely at extreme low levels

Observed May rain is shown in Fig. 7. May's total of 16 mm was low, but not particular extreme. Finally, the rain that did fall came on only five days(Fig. 8).
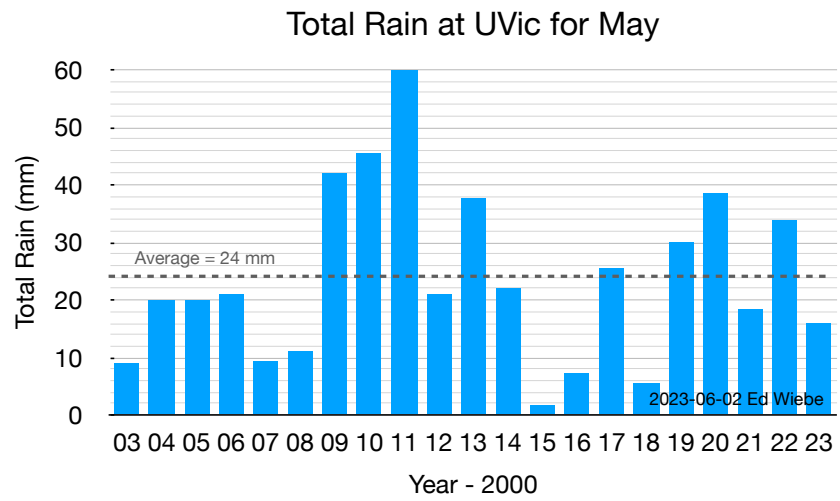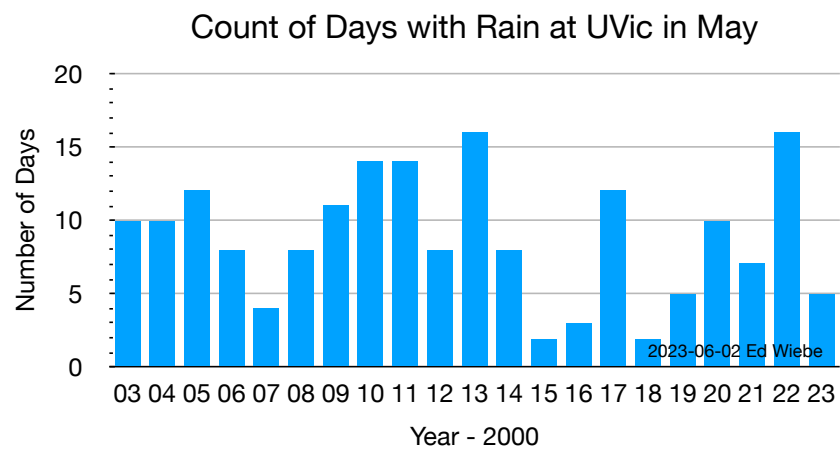
Figure 7: May rain at UVic.

Figure 8: May days with rain at UVic.

Update

2023-09-04 – I noticed an error in Figure 6. The totals were calculated incorrectly. The correct figure is below (9).
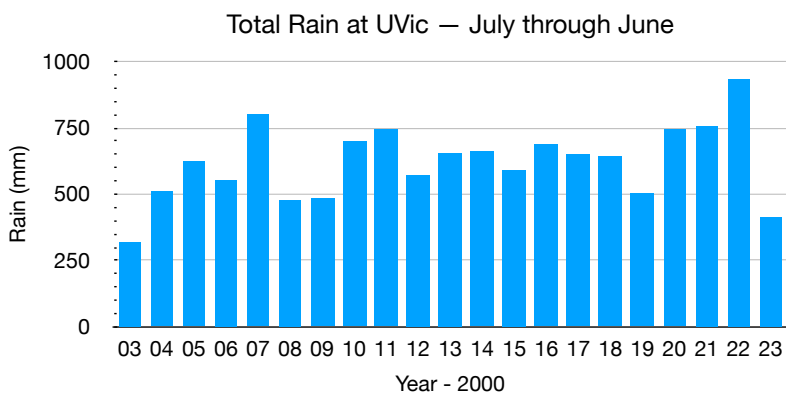

Figure 9: Annual Total Rain from July to July. 2023 is incomplete.

The text related to this figure is still mostly correct. The bars are plotted against the year that includes the end of the 12 month period. That is, the bar for 2015 is the sum of the rain from 2015-07-01 through 2016-06-30. The total amount for the period ending in May 2023 was below typical but the year ending in 2003 was drier.