

Figure 1: Month in a Minute video image.

### *February 2023*

Daily average temperatures and range for February, 2023 are shown in Figure 3. Current observations are shown overlying the 20-year averages. A few things are notable. Though there were a few warmer than expected days, overall the month was cooler than average (see also Fig. 2). The ups and downs observed in any one year are caused by weather events that year. These vary from year-to-year and ultimately tend to cancel each other out disappearing from the long-term record. However, there are hints of underlying patterns still visible. For example, this year late month temperatures *plunged* to  $-5^{\circ}\text{C}$  (cold, for the region). The long-term record (from 2003 to the present) shows a dip in the average temperature at the end of the month. Is this an indication that the end of February is typically cold? Or, is it just a coincidence of some cold events that happened to occur at the end of February?

The slight dip in the 20-year average temperature at the end of February is likely just a coincidence. Take a look at Fig. 4. The cloud of lines shown here are representative of February temperatures between 1890 and 2015. The heavy red line indicates the average of all of these years. Even with more than 100 years of values the long-term

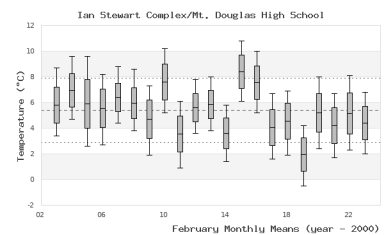


Figure 2: Monthly temperature recorded at UVic.

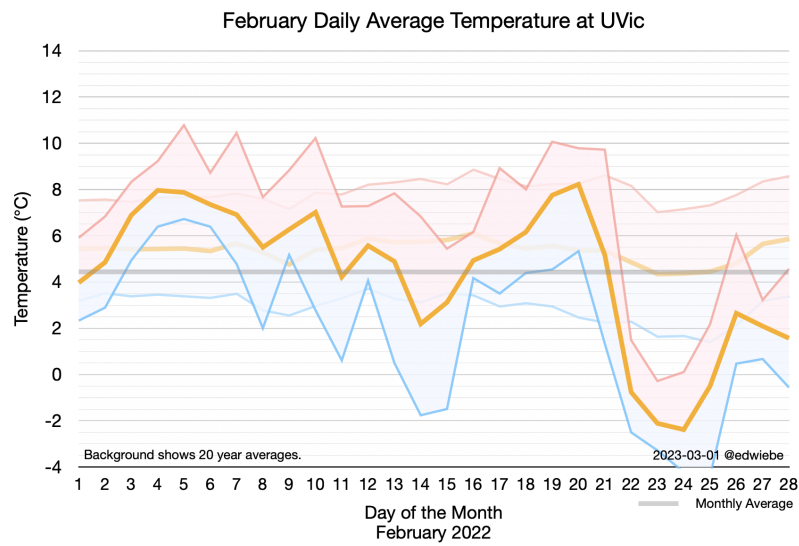


Figure 3: Daily temperatures.  
See text.

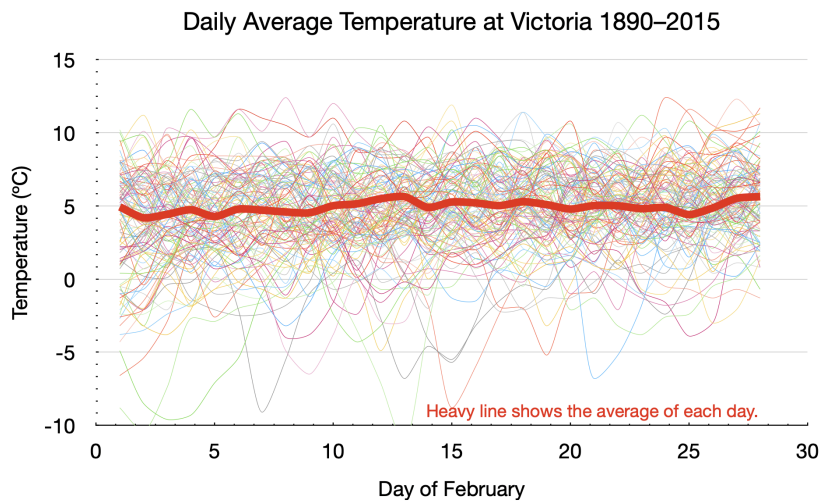
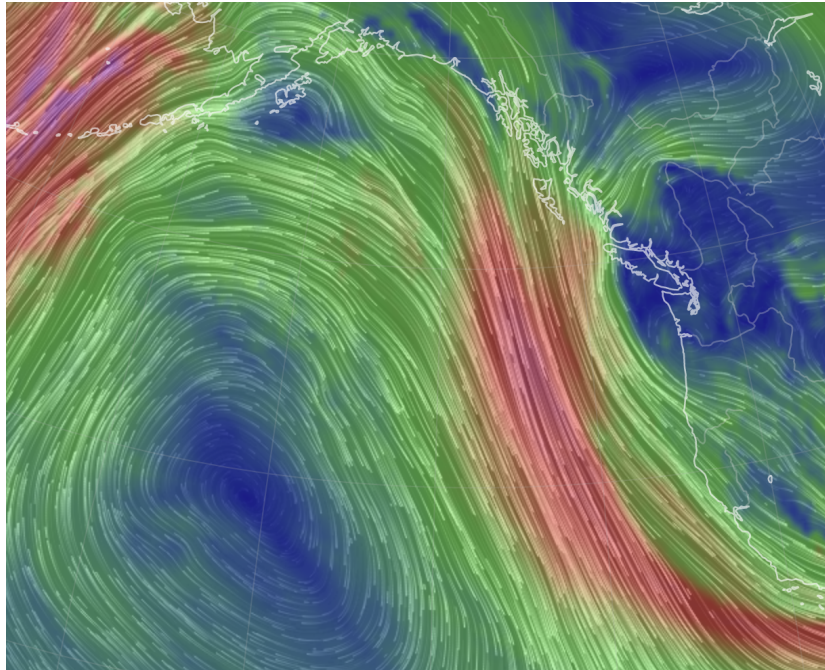


Figure 4: February temperatures  
in Victoria, 1890-2015.

average is not a precisely smooth, straight line. There's just too much variability at annual and decadal timescales. The data in Fig. 4 comes from Vincent *et al*, 2012<sup>1</sup>, updated to 2015.



<sup>1</sup> Vincent, L. A., X. L. Wang, E. J. Milewska, H. Wan, F. Yang, and V. Swail (2012). A second generation of homogenized Canadian monthly surface air temperature for climate trend analysis, *J. Geophys. Res.*, 117, D18110, doi:10.1029/2012JD017859.

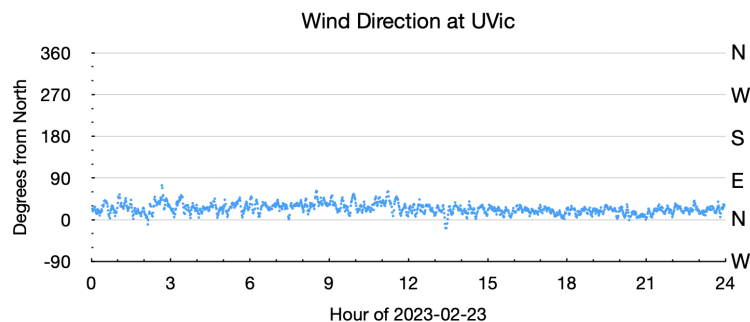


Figure 6: Wind direction at UVic, 2023-02-23.

The late month cold snap this year was caused by a very large loop in the jet stream. Nestled in the loop was a large anticyclone (high pressure system) over the Pacific Ocean between Hawaii and the coast of North America. Under the jet stream a strong flow of cold arctic air flowed southward. Wind speed dropped over land but flow was from the north for several days at UVic. Figure 6 shows five minute average wind directions on 2023-02-23. Near surface wind was quite steady

from a bit east of north. This persisted for the length of the cold event. The wind brought was cold and dry continental air flowing off of the continent, out of the mountains and the Fraser Valley, over Georgia Strait, to us at UVic.

It's quite usual to see the daily temperatures follow excursions from the expected (average) conditions. These are caused by large (synoptic scale) weather systems, such as low pressure cyclones, or blocking high pressure anticyclones. Such systems interact with the westerly wind and the jet stream(s). They persist for days or sometimes longer, depending on the particular circumstances. When they move by or weaken, a new pattern takes over. It's the timing, strength, and particular nature of these events that cause the differences we see on any particular day from year to year.

While our instruments at UVic do not record snow, they do record the melt from any snow or ice that accumulates in the rain gauge. We observed snow at UVic at the end of the month. A typical pattern for us is to see snow during the arrival or departure of a cold continental air mass. The boundary between the cold air and the warmer moister air from over the ocean can drive strong uplift and generally wet conditions. If it's cold enough we'll see snow.

A small amount of snow fell on 25 February, at the end of the cold snap, but soon melted away. However, UVic delayed opening on February 28 until noon, due to snow that had falling overnight and continued until about 09:00. The total accumulation at UVic was less than 5 cm but BC Transit was reporting closed and altered routes, especially in outlying areas. The airport, one of the few locations in the region where official snow records are collected, recorded snow each day from 25 to 28 February, with accumulations of 2, 2, 8, and 15 cm respectively. It's quite usual for the northern part of the Saanich Peninsula to see more rain or snow than do the municipalities in the south (Victoria, Saanich, Oak Bay, etc.).

February was a cloudy month this year (see the Month in a Minute video, <https://www.youtube.com/watch?v=vvvlAEVeu54>). And, it was just a bit wetter than is typical. Total rain recorded this year was 59.2 mm, a bit more than average (Fig. 8) but not extreme. The rain fell over 20 days, also a bit more than is typical (Fig. 9). This year with a drier than expected fall and winter, a bit of extra rain is welcome to recharge soil and groundwater, and our regional drinking water reservoir. As of this moment, the reservoir is at 96.8% capacity, very good but still under the five-year average (100%).

The three months, November through January, are the wettest of our year. February stands out as the first month of the drier Spring and Summer seasons. You can see a histogram of monthly rain in

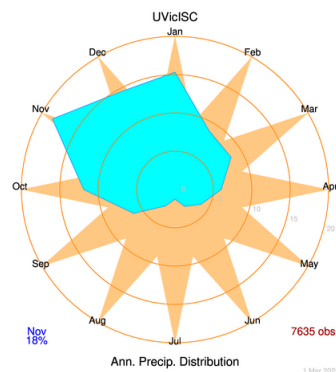


Figure 7: Seasonal rain patterns.

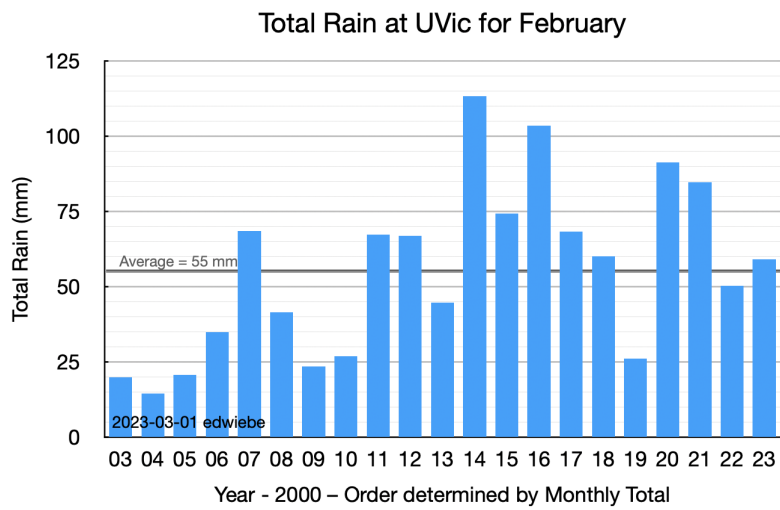


Figure 8: Monthly rain.

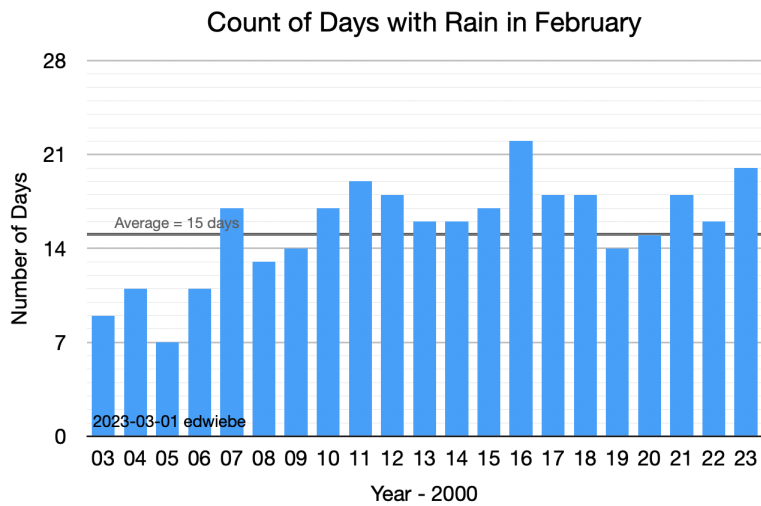


Figure 9: Days with rain.

Fig. 7. The histogram (blue) is wrapped around in a circle. Months lie on the points.

Finally, I'll mention that the strongest winds of the month occurred during the beginning of the cold event described above. On the night of February 20, wind gusts at Trial Island, south of UVic just offshore in the Salish Sea, one-minute gusts reached 120 km/hr. Wind warnings were issued for the region but it seemed that, perhaps due to specifics of direction, winds weren't as damaging as expected. We recorded gusts under 80 km/hr at UVic and saw debris, small branches, scattered around campus but there seemed to be little effect around the region.