

Figure 1: Blossoms on 1 March, 2024 at UVic.

February 2024

## Temperature

Some people remarked to me that this past month seemed warm; I heard the word balmy, which I thought was a bit much. It seemed pleasant enough, for February. Daily temperatures, compared to the 20-year average are shown in Fig. 2. The average temperature this month was 6.40 °C, ranked sixth warmest since 2003. The mean is 5.4 °C. Figure 3 shows this month in comparison to previous Februaries. I'm not sure 1 celsius warmer really counts as balmy, but it was more pleasant than it could have been. Various flowering trees in my neighbourhood found conditions favourable enough to begin to bloom





Figure 2: Daily temperatures at UVic.







Figure 4: Rain in February (top) and count of days with rain (bottom).



Daily Rain (mm)	Number Observed
0-5	546
5-10	43
10-15	18
15-20	11
20-25	2
25-30	1
30-35	о
35-40	0
40-45	1
>45	о

## Rainfall

Rainfall was average this month. 57.1 mm was observed compared to 55.3 mm in the 20 year average. We need to be a bit thoughtful about the average monthly rain. The standard deviation of the monthly values is 28 mm, half of the mean. There's a lot of variability from year to year (see Fig. 4) In terms of days with rain, February exceeded the average, by a few days. This is a more consistent measure, at least in the later part of the record here at UVic.

The table at right and Figure 5 provide a histogram of all daily rain totals in February at UVic since 2003. The main panel of the figure

shows all observations. 88% of daily rain totals are less than 5 mm. In the inset panel I've removed the smallest events, in order to see those that are more rare. This month we saw a day (the  $28^{th}$ ) with only one of two day rain totals greater than 20 mm (since 2003).



Figure 5: Histogram(s) of daily rain in February at UVic.

Revisiting a figure from last month, the monthly rain frequencies in Figure 6 can be seen to fall into three zones. This is quite informal, call it a sketch of what's happened in the past. The rainy season is October through January. Rain here is mostly delivered by mid-latitude cyclones and atmospheric rivers (AR). February through April are the transition period. We still may see some storms, and AR events but we're also starting to see convective events, local showers. These tend to deliver less rain overall than the bigger winter storms. By May we'll (usually) be well into the dry season, which can last through September.

At the end of the late-month cold snap, we observed some light snow, late in the afternoon on 2024-27. This was probably (hopefully!) the last snow for the season. The snow arrived first in the form of graupel, then fluffy flakes and finally melty and wet. There was only ever a trace amount.

What is graupel I hear you asking? Graupel are small snow pellets, a few millimetres in size. They form as ice crystals (snowflakes) fall into a layer of super-cooled water droplets. The water droplets freeze on contact with the falling crystal giving it the appearance of being covered in frozen foam. They are less dense than solid ice (hail) and usually take the rough shape of the underlying crystal. This can be pellet (roughly round, or with a pointed end) or snowflake shaped. Graupel is reasonably common here in Victoria. At the end of this document Fig. 8 shows some examples.



Figure 6: Rain frequency at UVic.

February can be gloomy. This year was the gloomiest since 2004. How do I measure gloominess? The weather station measures the global average power received at the surface from the whole visible sky (a hemisphere). Most of this is the direct light from the sun, but some comes from the sky itself or may be reflected from clouds. Summing this up over the course of a day gives total energy. In the top panel of Figure 7 the total insolation for all observed Februaries is plotted relative to their average. These are then compared to the mean by subtracting 1 (a month with the average value gives a relative value of 1). A gloomy month is negative in this formulation. 2005 was apparently exceptionally sunny, a bright month.

$$Gloom Index = \frac{Sunniness}{Average Sunniness} - 1$$
(1)

What the graph shows is the this past month was the gloomiest recorded (since 2004). This fits with perceptions. It seemed like we had very few sunny breaks. The Month in a Minute video is on the Youtube.

The bottom panel of Fig. 7 shows the same data but each February is shown. Reading vertical columns gives an idea of what each day of the month was like for a given year. Again, these are relative measure, compared to the overall average of each day in this case. Be careful with the rows in this graph. It's probably meaningless to try to make sense of them. They represent the same day of February in each year. There's no connection between any particular day of the month and the same day in a different year, other than the fact of the season, and overall seasonal climatic effects that are (approximately) the same from year to year. The weather on a particular day isn't connected in any meaningful way to the weather a year earlier or later.

Ed Wiebe gets the credit and the blame for this document. Let me know if you like it or if you have concerns about it. *ecwiebe at uvic.ca* 





Figure 7: Relative insolation at UVic.



Figure 8: Examples of graupel.