

I had a much closer look at the data from one of the sap flow sensors at Kamarooka over the weekend. I noticed from the record last week that the trees appeared to shut down (once again) in response to the heat of last Friday. This time I selected just one tree and downloaded the data for the day. This way I get a clean crisp set of numbers that allow for a much closer look.

The tree I chose was one of the sugar gums we started monitoring about a month ago when we re-installed the sap flow gear after resolving the issues with probes becoming glued into trees. I chose to monitor this tree because the leaf area is quite large for its size (this is code for saying that the NUFG lift pruners have not yet had their way with it). I have placed a few images on the website, and you can see one of them by following this link:

[http://www.nufg.org.au/images/Kamarooka%20Sap%20Flow%20Trees/Sap\\_1935.jpg](http://www.nufg.org.au/images/Kamarooka%20Sap%20Flow%20Trees/Sap_1935.jpg)

I also chose to monitor this tree because one day I intend to let the lift pruning loose and see what difference it makes to the sap flow in the poor organism that survives. The serial number of the sensor is SVP98049 if you are interested in looking at the other images.

The image file for the sap flow data from last Friday can be viewed at the following address:

<http://www.nufg.org.au/images/Kamarooka%20Sap%20Flow%20Trees/Jan22B.pdf>

I think the fascinating thing about this data is the immediate shut down that occurs at 10.00 AM. Remember there are two sensors on the probes that give us an inner and outer reading in the xylem. In this instance the outer probe is labelled 'I' and the inner is labelled 'J'.

We see that as the morning warmed up the sap in the deeper xylem moved upward at a faster rate than that in the outermost regions. As usual, in addition to plotting the sap flow data I have included the instrument temperature. This is higher than air temperature but it is a good guide to the trend.

As the morning of last Friday rapidly warmed, and the relative humidity plummeted, water stress kicked in at 10.00 AM. The response was immediate. By 10.15 sap flow had reduced by one third. An hour later it was less than a quarter of the peak value recorded at 10.00 AM. This was a repetition of the response we first recorded on Black Saturday last year I have placed the Black Saturday story on the web on the sap flow page:

<http://www.nufg.org.au/images/Kamarooka%20Sap%20Flow%20Trees/Black%20Saturday%20and%20Kamarooka.pdf>

I have now seen this 'shut down' response many times but I still find it very interesting. Most of us tend to think about things happening in trees over relatively long time frames, but when you have the opportunity to look inside there is a lot going on over a very short period, and the processes are very dynamic. They are so responsive to the climatic conditions of the day.

The timing of the shut down is linked to water stress, and (once again) that is about atmospheric demand and the ability to supply. This should in turn reflect the salt stores in the soil and subsoil. The shut down should kick in earlier where osmotic pressure induced by salinity is high. It would be good to test this in plantations that do not have a high salt store.