

New Text Document

Well here I am again a little less sleep deprived than last night and prepared to say a few things about the latest sap flow measurements. Please compare today's results (attached) with those of the past week. Note the climatic conditions of today were much milder than those experienced in the heat wave of the past week, and the trees have not seen the same need to close down their transpiration. They are not water stressed in the same way as yesterday or indeed most days of the past week.

The big message from today surely comes from the cold front that came through from the west between 3.30 and 4.00 PM. The sudden drop in temperature, most probably caused by rain, together with the loss of light from the cloud cover, and an increase in humidity caused by the rain shut the water use of the trees down for about 30 minutes between 3.30 PM and 4.00 PM. They simply stopped!

What do we learn from this and the heat wave of the past week? I think the lessons are as follows:

(1) That extremes temperatures on bright sunny days with decreased humidity create transpiration demands that are at odds with the ability of the trees to keep up with the water flow up the stem via the xylem tubes. The trees survive by reducing their water use so that demand is consistent with their capacity to supply. We know they do this by partial closure of the stomata (openings) in their leaves. We also know that they achieve closure by generating abscisic acid (ABA) that deflates the guard cells around the stomatal openings by releasing potassium from the guard cells that surround the same.

(2) We confirm first hand from today's results that light (in particular) and temperature/humidity regulate photosynthesis and that the same is intimately related to water use. The passage of the cold front is not a mere curiosity, it reveals so much of the way these organisms (trees) function.

We must continue to keep in the front of our minds that we are looking deep within these trees at their biological function in an environment that is filled with salt. Are they unhappy with this condition? The answer continues to be no! Are they able to regulate their metabolism to sustain themselves in a high saline environment? The answer continues to be yes!

The sap flow gear allows us to look at how an organism as old as the hills, perhaps older, have worked out (evolved) the means to survive in the presence of conditions of high salinity. We continue to see the great threat of salinity in these organism was always with waterlogging. Salinity alone presented less of a challenge.

One other small thing I need to say. Remember the story of the roo that ripped the probes out of one of our trees. Well have a look at the results from the two sensors that have show the greatest distance from the zero axis. Yes, these results are from that set of probes. I managed to straighten them and they continue to report good results, nevertheless some damage is evident in the data.

*To those that have asked I cannot yet identify each of the traces in the graph with particular trees. I need to visit the site to do that and the heat wave of last weekend stopped me from doing that. I will, however, do the same in the very near future. We have three *E. occidentalis* and three *E. cladocalyx*.*