Qsoil comments

So I've now taken just one core each at S9 and S15 (the only sites with Qsoil sensors). The results were: EC-5 67%/65% and Gravimetric 90%/89%, which could be interpreted as the EC-5 having a bias of 23%. A bias or gain change is plausible, since we are in saline conditions, though I don't know if the marsh exceeds the EC5 salinity operating range (8 dS/m for mineral soils). (Seawater is supposed to be 54 dS/m, so 8/54 = 15% seawater certainly could be exceeded in the marsh.) I'm actually impressed that the two EC-5 probes read as close as they do, that the two gravimetric samples were close, and that the higher EC-5 reading was associated with the higher gravimetric reading. This is especially true given the difficultly in obtaining a gravimetric core, with lots of sample handling issues.

Clearly, it takes more than one point to develop a calibration. Usually, we take a sample in wet conditions (shortly after rain) and dry conditions, to have a large calibration range. I had hoped that data from high-tide and low-tide would produce such a variation; however, during the entire experiment here, the EC-5 probes have varied in time by only 1%. It would be unprecedented for the accuracy of our gravimetric readings to be 1%, usually due to spatial heterogeneity, and I don't see why here would be any different. Thus, all of our samples here will be effectively at only one soil moisture level, which will make it impossible to distinguish a gain from an offset.

Perhaps all this is a good thing: if Qsoil doesn't vary with time, it can be treated as constant and set to the average value of the gravimetric readings, essentially ignoring the EC-5 data. Since they will be important, we should still take more gravimetric samples.

Once we get the TP01 probes sampling again, we could try looking at the bulk soil heat capacity measurements to confirm/deny that Qsoil is constant. (I do wonder if the TP01 heat pulse method itself will be valid in "soils" with flowing water...)