



## Silviculture Instrumentation Tech Tips

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March, 2004

### **7. Thermocouple Errors Caused by Wet Wiring.**

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***The Short Version.*** Long runs of thermocouple wire with woven insulation for both the conductors and the sheath, instead of the typical plastic coating, can result in low readings if the woven jacket gets wet. You have to wait for it to dry out, or you may see errors of 3 °C to 5 °C.

***The Long Version.*** Some time back, we were collecting temperature measurements on a fire in an oak stand. We knew that the temperatures were predicted to get as high as 700 °C, so thermocouple wire with a plastic jacket wouldn't serve the purpose (the plastic would melt!). Instead, we used a high temperature wire with a glass-braided jacket and a glass-braided conductor insulation. We had 10-m to 20-m thermocouple runs. The prescribed burn we were measuring couldn't be set until the ambient conditions were ideal, so we ran the wires and left them in the open for several nights.

The dew settled on the wires during the night and we found that the wet insulators made a conductive path between the wires and lowered the indicated temperature by as much as 5 °C. Once the relative humidity dropped low enough to dry the wires out, the temperature readings returned to normal. Fortunately, this was during the summer and we had the conditions that would dry out the braided materials by 10 a.m. to 11 a.m. If you can not rely on low humidity conditions prior to data collection, the wires must be kept dry and deployed in the field just prior to use.