Varia
2012 11-17 (322) to 2012-12-19 (354)

During this period data from sensors attached to the AM16/32 multiplexor were shifted one channel ahead so that channel two was read with the instructions for channel one. This resulted in the first channel on the multiplexor (Pyranometer) to be completely lost. Three channels (HMP45_Tair, CNR1_CMin, Diffuse_1 [total PAR from BF3]) were lost because they were read with an incorrect range. Two channels (HMP45_RH and AirPress) were read with the wrong span and offset but were recovered by backing out the wrong values and applying the correct ones. And the two channels from the BF3 diffuse PAR sensors were lost because of a damaged connector that was the likely cause of the problem.

Timeline:

Date	DOY	Time	Notes
11/17/2012	322	15:00	First bad data from shifted multiplexor
11/22/2012	327	4:30	Fixed itself for 90 minutes – a few half hours of bad data on either side of the good data
11/22/2012	327	8:00	Multiplexor data shifted again
4/5/2012	354	12:30	Field visit and multiplexor is fixed

Channels affected and the solution:

Channel	Status-fix
Pyranometer	Lost - fill with Tonzi
Rnet	Recovered
PAR_in	Recovered
PAR_out	Recovered
HMP45_Tair	Lost - fill Tonzi Floor HMP45
HMP45_RH	Offset
AirPress	Offset
CM_in	Lost - fill with Tonzi
CG_in	Recovered
CM_out	Recovered
CG_out	Recovered
BF3_PAR	Lost - fill with PAR_in
BF3_Diffuse	Recovered
LED_Red_in	Recovered
LED_NIR_in	Recovered
LED_Red_out	Recovered
LED_NIR_out	Recovered

For the two time periods:
2012-11-17 (322) 15:00 to 2012-11-22 (327) 3:00

2012-11-22 (327) 8:00 to 2012-12-19 (354) 12:00

The following steps were used to fix the data:

1) Rs_Ro1 and PRT1 (CNR1 PRT) were moved out of the middle of the multiplexor channels.
2) Data for the 18 columns from Pyranometer to zero_mux2 were shifted one column to the right leaving the Pyranometer column empty.
3) The data now in the RH column was collected with the instruction for Tair. The Tair multiplier (0.1) and offset (-40) were removed and the RH multiplier (0.1) and offset (0.0) were applied.
4) The data now in the AirPress column was collected with the instructions for the RH. The RH multiplier (0.1) and offset (0.0) were removed and the AirPress multiplier (0.0184) and offset (60) were applied.

5) The pyranometer data was filled with -9999. Might be able to fill from the Tonzi pyranometer data using a regression. From the spring the regression from the Tonzi data is V = 1.0116*t + 0.0223 R2 = 0.98.

6) The HMP45 air temperature data was filled with -9999. Might be able to fill from the Tonzi Floor HMP45 Tair data using a regression. From the spring, the regression from the Tonzi data is: V = 0.9413*T + 1.4961 R2 = 0.98. The regression with the Tonzi floor data was even better than the Vaira sonic air temperature.

7) The CNR1 CM (shortwave) incoming data was filled with -9999. Might be able to fill from the Tonzi pyranometer data using a regression. From the spring, the regression with the Tonzi data is V = 2.0589*T + 0.0031 R2 = 0.99.

8) The total incoming PAR from the BF3 sensor was filled with -9999. Might be able to fill from the Vaira incoming PAR using a regression. From the spring, the regression was BF3 = 197.73 * PAR + 1.0691 R2 = 0.997. A lot of the BF3 data was missing because of the broken connector and more historical data could have been used for the regression, but this is a somewhat redundant data column and the regression was strong.

A new file was created with the corrected data and the little piece of good data from 11/22 incorporated. There was no attempt to recreated the standard deviation data that is present in the original files thus all the standard deviation the affected columns were set to -9999. This file should replace the original files for standard processing:

GR3_2012354.23x

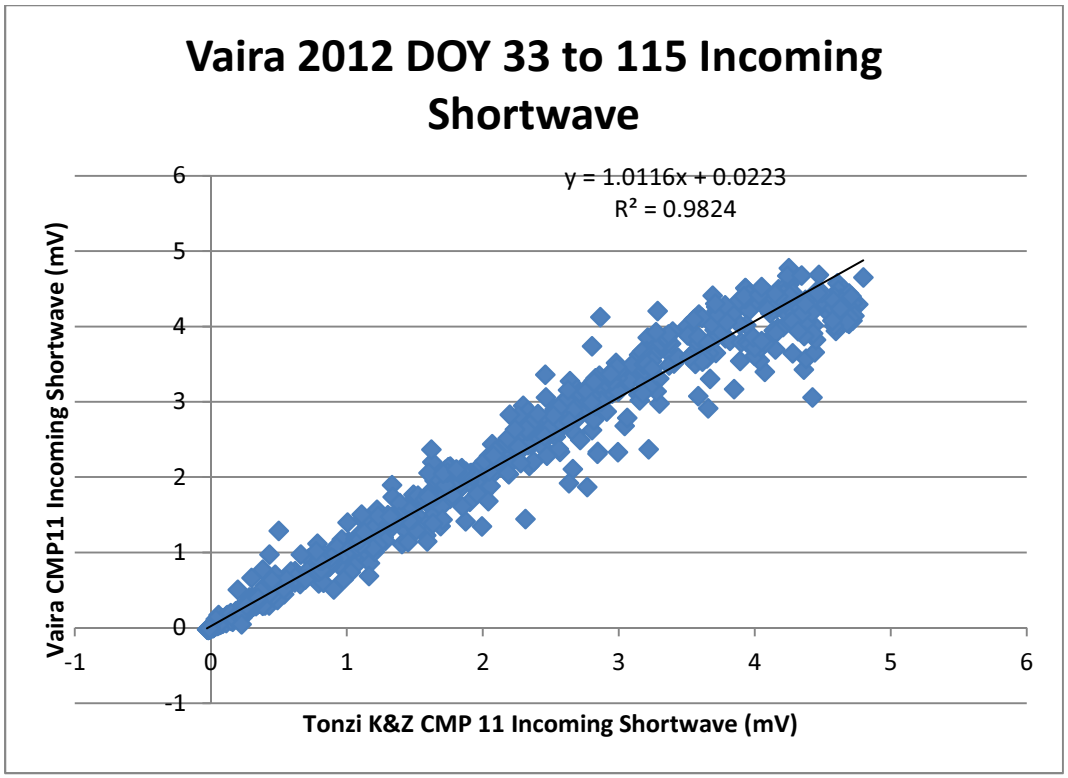

Fig 1. Pyranometer regression

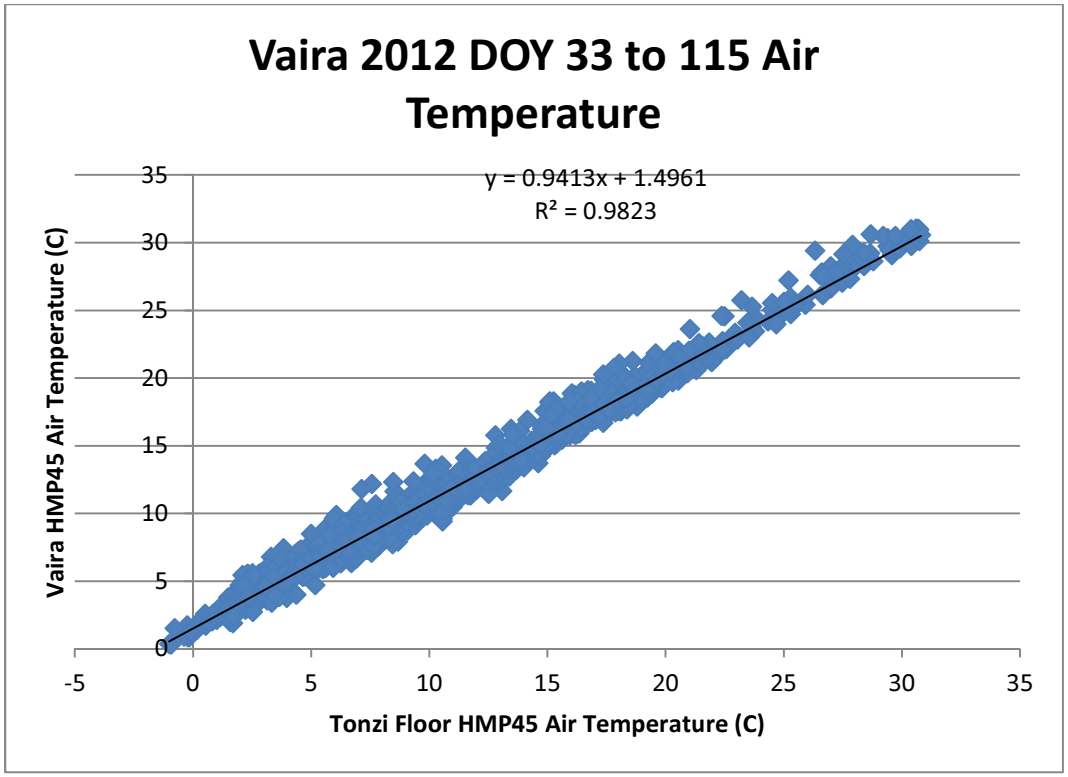

Fig 2. HMP45 Air Temperature Regression

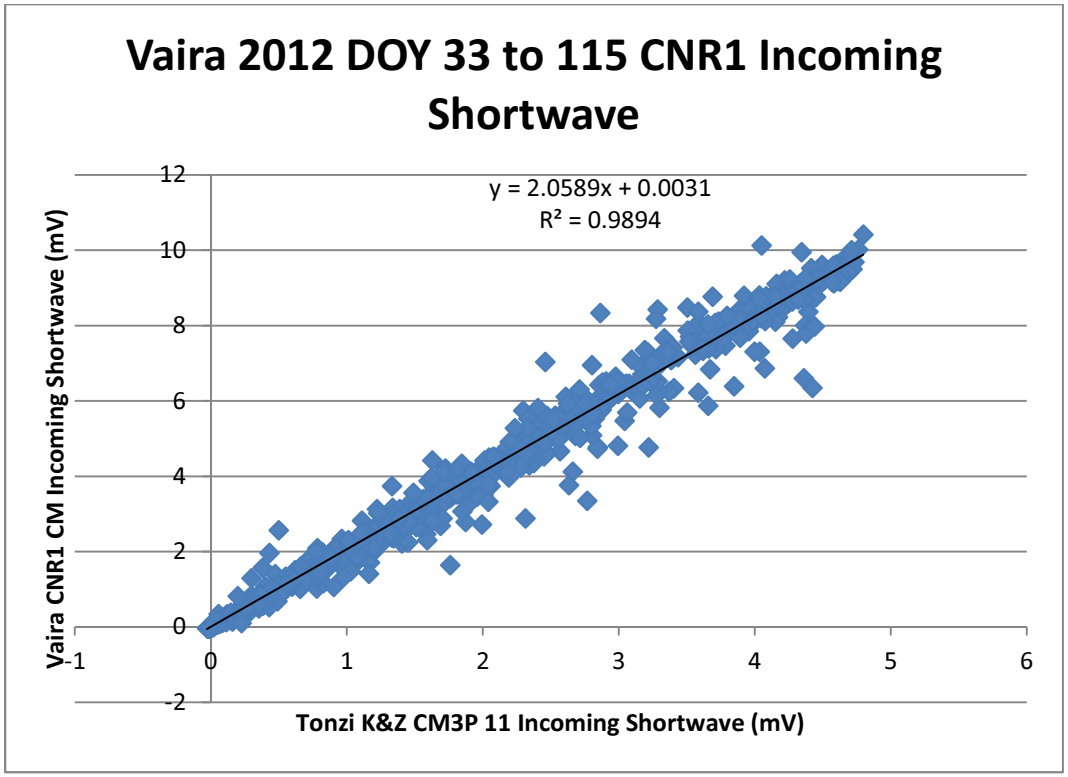

Fig 3. CNR1 Incoming Shortwave regression

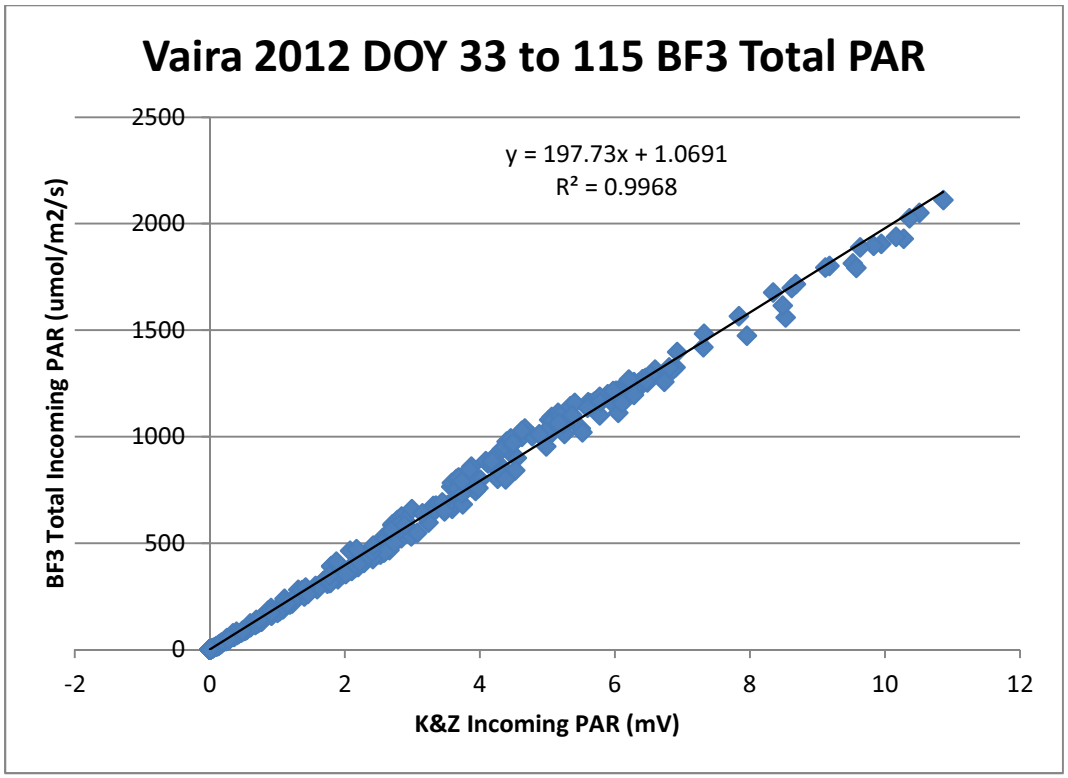

Fig 4. BF3 Total PAR regression