Motte Rimrock Nature Reserve

1. Location
   1.1. Latitude: 33°48'16.30"N
   1.2. Longitude: 117°15'33.94"W

2. Site Description
   2.1. http://nrs.ucop.edu/reserves/motte/motte_rimrock.htm

3. Node Description
   3.1. Only one node. It is bare or sparsely vegetated with grasses and forbs. One set of soil sensors—soil temperature, soil moisture and soil CO2 at three depths—were installed in Nov. of 2012.

4. Sensor List

#	Items	Area	Manufacturer	Model #
1	Carbon Dioxide Sensors	Below Ground	Vaisala	GMM222G0A0A3A2G1B
2	Soil Temperature Probes	Below Ground	Campbell Scientific	108-35L
3	Soil Water Content Probes	Below Ground	Campbell Scientific	CS616-35L
4	Data Logger	Below Ground	Campbell Scientific	CR1000-XT-SW-NC
6	Multiplexer	Below Ground	Campbell Scientific	AM16/32B-XT-SW
7	Enclosure	Below Ground	Campbell Scientific	ENC12/14-DC-MM

5. Output Data File

Column ID	Header	Unit	Note	Frequency
1	Date_Time		GMT-8, winter time	Every 5 min
2	Battery	V		Every 5 min
3	Logger Temp.	deg C		Every 5 min
4	ST_2	deg C	2 cm	Every 15 sec, average of 5 min
5	ST_8	deg C	8 cm	Every 15 sec, average of 5 min
6	ST_16	deg C	16 cm	Every 15 sec, average of 5 min
7	WC_2	m3 m-3	2 cm	Every 15 sec, average of 5 min
8	WC_8	m3 m-3	8 cm	Every 15 sec, average of 5 min
9	WC_16	m3 m-3	16 cm	Every 15 sec, average of 5 min
10	CO2_2	ppm	2 cm	Every 15 sec, average of 5 min
11	CO2_8	ppm	8 cm	Every 15 sec, average of 5 min
12	CO2_16	ppm	16 cm	Every 15 sec, average of 5 min

6. How to calculate flux.
   6.1. When downloading data, unselect record numbers.
   6.2. A file named " *Table1*.dat" has soil sensor data.
   6.3. Run "MotteFlux.m" with MATLAB.
   6.4. It calculates soil efflux and CO2 production every 5 min, and save results in Min5_mm_dd_yyyy.mat file. Date indicates the last date of the measurements.
   6.5. It also compiles all data in one file, and save results in MotteFluxMin5.mat file.
   6.6. It also exports every data point in MotteMin5_mm_dd_yyyy.txt file.

6.7. It also exports daily average data in MotteDailyAverage_mm_dd_yyyy.xls.
6.8. The value “-9999” indicates missing data.
6.9. Other technical issues.
6.9.1. CO2 concentrations were not corrected for temperature and barometric pressure. However, this correction is very small.
6.9.2. Negative soil efflux and CO2 production values were ignored.
6.9.3. Bulk density (1.35) is based on:
Journal of Arid Environments, Volume 70, Issue 1, July 2007, Pages 164–173, Carbon and nitrogen storage in soil and litter of southern Californian semi-arid shrublands, G.L. Vourlitis, , G. Zorba, S.C. Pasquini, R. Mustard

7. Wiring Diagram

Sensor	Color	CR1000	Note		
CS650 (1)	Red	12 V	2 cm		
	Black	Ground			
	Green	C1			
	Orange	Ground			
	Shield	Ground			
CS650 (2)	Red	12 V	8 cm		
	Black	Ground			
	Green	C3			
	Orange	Ground			
	Shield	Ground			
CS650 (3)	Red	12 V	16 cm		
	Black	Ground			
	Green	C5			
	Orange	Ground			
	Shield	Ground			
CO2 (1)	Red	1H	2 cm	0-5 V	10,000 ppm
	Black	1L			
CO2 (2)	Red	2H	8 cm	0-5 V	10,000 ppm
	Black	2L			
CO2 (3)	Red	3H	16 cm	0-5 V	10,000 ppm
	Black	3L			