

# Energy Balance Experiment 2000 (EBEX00) ISFF Report

<https://www.eol.ucar.edu/isf/projects/EBEX2000/index.html>

## News

- Nov 21, 2003: 5-minute averages of Tdome/Tcase have been corrected (see below).

## Introduction

This document is a standard product of [NCAR/ATD/ RTF](#) which gives an overview of the measurements taken using the [Integrated Surface Flux Facility \(ISFF\)](#) and conditions during the EBEX2000 field experiment. This document can be obtained in hard copy from RTF upon request.

If you reached this page from a search engine, click [here](#) to see the full report, with frames.

Steve Oncley has a separate [WWW site](#) now used for EBEX2000 data analysis.

## Participants

- S. Oncley; NCAR/EOL, Colorado
- T. Foken, M. Mauder, C. Liebenthal; University of Bayreuth, Germany
- R. Vogt, A. Christen, E. van Gorsel (now: CSIRO, Australia), I. Lehner; University of Basel, Switzerland
- C. Bernhofer; Dresden University of Technology, Germany
- W. Kohsiek; KNMI, The Netherlands
- H. de Bruin; Wageningen University, The Netherlands
- D. Grantz; University of California, Kearney Research Center, California
- H. Liu; Jackson State University, Mississippi (formerly: City University of Hong Kong, Hong Kong)
- A. Pitacco; University of Padova, Italy
- L. Ribeiro; Braganca Polytechnic Institute, Portugal
- T. Weidinger; Eotvos Lorand University, Hungary

## Location

ISFF operated 9 sites with 5 and 10m towers in the eastern half of Section 17, of T21S, R19E

(about 50 miles south of Fresno, CA) in cooperation with several other research groups. A [layout](#) of these sites is available. The locations of all sites were:

- Site 1: 36deg 6.277'N, 119deg 56.145'W
- Site 2: 36deg 6.184'N, 119deg 56.065'W
- Site 3: 36deg 6.091'N, 119deg 55.999'W
- Site 3 (after 14 Aug): 36deg 6.582'N, 119deg 56.135'W
- Site 4: 36deg 6.116'N, 119deg 56.131'W
- Site 5: 36deg 6.023'N, 119deg 56.066'W
- Site 6: 36deg 5.930'N, 119deg 55.998'W
- Site 7: 36deg 5.953'N, 119deg 56.131'W
- Site 8: 36deg 5.860'N, 119deg 56.066'W
- Site 9: 36deg 5.767'N, 119deg 55.999'W
- Site 10 (approx): 36deg 5.77'N, 119deg 56.13'W

## Chronology

- 12 Jul: Base installed.
- ~21 Jul: Begin flux sensor intercomparison.
- 28 Jul: Start main operations.
- 14 Aug: Move site 3 to fallow field upwind.
- 24 Aug: Begin tear-down of profile and some flux sensors.
- 25 Aug: Tear-down of remaining sensors.

## Table of Variables

## EBEX2000 Data Access

NOTE: ALL OF THESE DATA CURRENTLY ARE PRELIMINARY IN-FIELD RESULTS AND HAVE SEVERAL KNOWN ERRORS. EXPECT THESE VALUES TO CHANGE.

Data for EBEX2000 are currently available in these forms:

- Preliminary, unchecked and unedited 5-minute averages of first and second-order moments of calibrated data are available as [NetCDF files](#), each containing one day's data from 00:00 to 23:59 GMT. These files include all data from the nine tower sites that was acquired by NCAR. We recommend combining these to obtain more statistically-significant averages over longer time periods. These files contain data from the intercomparison period, Jul 18-30, and the normal operations, Jul 30-Aug 27.

Also available is a computer-readable [logbook](#) of comments noted by field project personnel.

## EBEX2000 Photographs

Images either taken with a digital camera or scanned from prints sorted by [directory](#). Click on a directory name, and then on a thumbnail image on the "contact sheet" to view. Contributions from Steve Oncley, Steve Semmer, Luis Ribeiro, Thomas Foken, Heping Liu, and Roland Vogt.

## Sensors and Data Processing

### Radiometers

Table of the radiometers used to measure the radiation components. CM21, CM14, CNR1 are models by Kipp and Zonen, PIR and PSP are by Epply, Q7 is by REBS. A "v" suffix indicates that the sensor was ventilated. All sensors were mounted on stands approximately 2~m above the ground. Two or four sensors at one height are indicated by x2, x4, respectively. [site 9 not ventilated?]

Parameter	Sites 1-6	Site 7	Site 8	Site 9
R_net	Q7	Q7	Q7	Q7
		CNR1		CNR1
		Schultze-Dake		
R_sw down		PSP	PSPv	PSP
		CM21v		CM21x2
		CM14v		
R_sw up	PSP	PSP	PSPv	PSP
	CM21v	CM14v		CM11
R_lw down		PIRv	PIRv	PIR
R_lw up	PIRv	PIRv	PIRv	PIR

T_sfc		KT15	Everest x4	
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I wrote a quick [report](#) of an investigation of the difference between Rlw from stations 2 and 6.

However, we have learned that not only did our data system corrupt coefficients used for Tdome and Tcase of the pyrgeometers (see [PIR/CR10X Report](#)), we also applied incorrect coefficients. These data have now been corrected.

Tony Delany has written a draft [report](#) on the radiometer calibrations used in EBEX. We expect this document to be revised soon. I've also made a quick [Table of B-values](#) for our radiometers.

[Here](#) is an outdated description of an investigation which fails to correct shortwave radiation values. Supposedly, Chris Fairall has a recent paper on this subject.

## Sonic Anemometers

Table of turbulence measurements at the EBEX sites. Heights in m are in parentheses. Two sensors at one height are indicated by x2.

Parameter	Sites 1,3	Sites 2,4-6	Site 7	Site 8	Site 9
Wind velocity	UW (4.7)	ATI-3K (4.7)	ATI-3K (4.7)	UW (4.7)	UW (4.7)
and T_c			Kaijo-Denki TR90-AH (1.76)		CSAT3 (2.4)x2
			Kaijo-Denki TR90-AH (2.76)		Gill R2 (2.4)x2
			CSAT3 (2.7)		CSAT3 (6.0)
			CSAT3 (4.7)		Gill HS (6.0)
			CSAT3 (8.7)		Metek USA-1 (6.0)

Humidity	KH20 (4.7)	KH20 (4.7)	KH20 (4.7)x2	KH20 (4.7)	KH20 (4.7)
			KH20 (1.7)x2		KH20 (2.4)
			KH20 (2.7)x2		KH20 (6.0)
			Li7500 (4.7)		Li7500 (6.0)
			KH20 (8.7)		
Fine-wire T			AIR150 (4.7)		Heinmann (6.0)x2
			Campbell (2.7)		
			Campbell (8.7)		

[Here](#) are selected comments about the sonics from our logbook, including the boom angles shot for all of the wind sensors for EBEX (including props). Note that station 3 was never shot before it was moved to the fallow field. I plan to compute it using data from strong wind cases, but seem to recall that a first attempt wasn't very successful.

Even more worrisome is that we learned during SGS that all of our theodolite-based sunangles were computed with the sun\_angle program set to the year 1900 (a Y2K bug!). We've estimated that the angles could be off by 0.5 degree. We might be able to correct them if we knew when the angles were shot, but we didn't keep track of these times. The data\_scope angles that were shot for the IC period should be okay (though only good to 0.2 degree themselves).

## Prop-vanes

Table of profile measurements at the EBEX sites. Heights in m are in parentheses. [NCAR model num., KNMI ht]

Parameter	Site 7	Site 8	Site 9
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Wind speed	Climatronics F460	Modified RM Young	Vector A101L
	(1.2,1.7,2.7,3.7,4.7,5.7x2,	(1.7,2.7,4.7,6.7,8.7,10.7)	(0.95,1.50,2.35,3.72,6.12,9.05)
	6.7,7.7,8.7,9.7,10.7)		
Wind direction	Climatronics F460	Modified RM Young	Vector W200P
(10.7)	(1.7,2.7,4.7,6.7,8.7,10.7)	(9.0)	
Temperature and	Frankenberger	NCAR/Vaisala	Frankenberger
Humidity	(0.7,1.2,1.7,2.7,3.7,4.7,5.7,	(0.7,1.7,2.7,4.7,6.7,8.7,10.7)	(0.95,1.50,2.35,3.72,6.12,9.05)
	6.7,7.7,8.7,9.7,10.7)		
	Vaisala HMP223		
	(3.50?)		

See the sonic anemometer comments above about boom angles. We also probably had prop collar slippage which affected directions on one sensor:

00 Aug 12 04:00 - 00 Aug 12 07:00 Dir.1.7m too large by ~40deg  
00 Aug 12 08:00 - 00 Aug 16 22:00 Dir.1.7m too large by ~67deg

## T/RH

## Soil

Table of the soil sensors used at the EBEX sites. Depths (in cm) of the sensors are in parentheses. Two or four sensors at one height are indicated by x2, x4, respectively.

<b>Parameter</b>	<b>Sites 1-6</b>	<b>Site 7</b>	<b>Site 8</b>	<b>Site 9</b>
T_soil	REBS (1-4)	REBS (1-4)	REBS (1-4)	REBS (1-4)
		Pt100 (2,5,10,20,50)		CS107x4
Q_soil	CS615 (2.5)	CS615 (2.5)	CS615 (2.5)	CS615 (2.5)
G_soil	REBS (5)	REBS (5)x2	REBS (5)	REBS (5)
				Rimco x4

## Daily Weather Plots

Click on the following to obtain once/day plots for several important measured variables. Each plot represents 24 hours of data. Please read the scales carefully for more details.

## Other plots

### Soil Moisture

A [plot](#) of gravimetric soil moisture data corresponding to the NCAR CS-615 soil moisture measurements is available