

PSD air-sea Flux System	Meta Data Report	
PI:	Chris Fairall	
Person(s) filing report (if different than PI):	Ludovic Bariteau	
Operation description:	Continuous measurement of meteorological variables and atmospheric fluxes at 10 Hz, sampled from the 18m level of the bow jackstaff.	
Sampling times and locations:	Continuous except when maintenance had to be done on the instruments or when the central data acquisition computer failed.	
Instrument details (see sheet #2 and #3 for additional details)	The basic flux system consists of six components: (1) a fast turbulence system with ship motion corrections mounted on the jackstaff. The jackstaff sensors are: GILL Sonic anemometer, Fast Ozone Sensor's inlet, LiCors LI-7500 fast CO2/hygrometer, and a Systron-Donner motion-pak. (2) A mean T/RH sensor in an aspirator on the jackstaff. (3) Solar and IR radiometers (Eppley pyranometers and pyrgeometers) mounted on top of wood pole on the 02 deck. (4) A near surface sea surface temperature sensor consisting of a floating thermistor deployed off port side with outrigger. (5) A Riegl laser rangefinder wave gauge mounted on the bow tower. (6) An optical rain gauge mounted on the bow tower	
Overall sampling strategy:(see sheet #2 for additional details)	Slow mean data (T/RH, PIR/PSP, etc) are digitized on a Campbell 23x datalogger and transmitted via RS-232 as 1-minute averages. A central data acquisition computer logs continuously all sources of data via RS-232 digital transmission and wireless radio modem network. 14 data sources were archived at full time resolution: Sonic Anemometer, 5 Licors 7500 (3 from university of Connecticut, Slow means (Campbell 23x), Laser wave sensor, Fast Ozone sensor, Systron-Donner Motion-Pak, Ship's Computer System, GPS, Heading system, CLASP (University of Leeds).	
Expected initial data products:	Raw data for each variables (ftp://ftp.etl.noaa.gov/et6/cruises/GASEX_2008). Bulk meteorological variables and fluxes were made available at the end of the cruise in the flux summary files (5min and 30min). 1-min daily ASCII files were also provided for the sonic, the mean data and the ship's system.	
Expected distributed data products, and time-frame for distribution:	Meteorological variables, radiative fluxes, and turbulent fluxes (covariance, ID, and bulk) will be produced at 10 min and hourly average. This will include mainly momentum, sensible and latent heat, ozone, and CO2 fluxes. Also estimated ozone and CO2 transfer velocity will be calculated. Hopefully available by summer 2008.	

Operation Log		
Affected data	Comments	Julian Day
3/1/2008 1600 GMT	Start flux measurement	61
3/4/2008 1700-1800 GMT	Split 2 Licors with Uconn system	64
3/4/2008 2300 GMT	Try test on wireless box Riegl. Channel disconnected	64
3/5/2008 0100 GMT	Test over. Riegl channel back	65
3/6/2008 2000-2200 GMT	DAS issues - no data for hour 21	66
3/7/2008 0500 GMT	DAS error - no data for this hour	67
3/7/2008 0500-1900 GMT	Licor (Sample Unit) down	67
3/8/2008 2200-2300 GMT	Communication with Riegl down and back on JD 69, hour 00 GMT	68
3/9/2008 0400 GMT	Communication with Riegl down	69
3/9/2008 1900 GMT	Uconn Licors down	69
3/9/2008 2000-2300 GMT	Uconn Licor down (li2)	69
3/10/2008 2100 GMT	Riegl communication back after trouble shooting	70
3/11/2008 0200 GMT	CLASP communication down	71
3/11/2008 0550 GMT	DAS error - no data for hour 5	71
3/12/2008 1500 GMT	After climbing mast, CLASP is back	72
3/13/2008 1900 GMT	DAS error - no SCS, met and li1 data for hour 14 to 18	73
3/14/2008 1700-1900 GMT	DAS totally frozen - repair DAS	74
3/16/2008 0240-0400 GMT	Uconn Licors down	76
3/17/2008 1400 GMT	Uconn Licor li1 and CLASP down	77
3/17/2008 1900 GMT	Uconn Licor li1 back	77
3/18/2008 0000 GMT	CLASP back after troubleshooting	78
3/18/2008 0100 GMT	Uconn Li1 down	78
3/18/2008 1100 GMT	CLASP down	78

Sensor	Measurement	Sampling Rate
Sonic anemometer (GILL instruments Ltd)	Wind speed, direction	10 Hz
Open Path CO2 / HO2 Analyzer (LICOR Inc.)	Direct covariance moisture/CO2 fluxes	10 Hz
Laser Distance Sensor (RIEGL)	Ocean Surface Wave height/Period	10 Hz
XYZ Motion Sensor (Systron and Donner)	Angular Velocity, Linear Acceleration	10 Hz
Gyrocompass (Robertson Marine Electronics)	Ship's heading (from SCS system)	0.5 Hz
GPS Smart Antenna (GARMIN)	Latitude, Longitude, Speed-over-ground, Course-over-ground	1 Hz
Air T/RH (Vaisala)	Air Temperature, Relative Humidity	0.1Hz, average to 1 min
Optical Raingauge (Optical Scientific, Inc.)	Rainfall	0.1Hz, average to 1 min
Precision Infrared Radiometer (Eppley PSP)	Solar Radiative Flux	0.1Hz, average to 1 min
Precision Spectral Pyranometer (Eppley PIR)	Longwave Radiative Flux	0.1Hz, average to 1 min
Surface water Sensor (YSI Incorporated)	Sea Surface Temperature	0.1Hz, average to 1 min
Air pressure sensor (Vaisala)	Atmospheric Pressure	0.1Hz, average to 1 min
Heading (Crescent VS100)	Ship's heading, Pitch angle	20Hz
CLASP (University of Leeds)	Sea spray particle flux	10Hz
Fast ozone Sensor (INSTAAR)	Direct covariance ozone flux	10Hz

see sheet#3 for more details

Fast ozone system		Meta Data Report	
PI:	Chris Fairall, Detlev Helmig		
Person(s) filing report (if different than PI):	Ludovic Bariteau		
Operation description:	Continuous measurement of atmospheric Ozone concentration at 10 Hz, sampled from the 18m level of the bow jackstaff.		
Sampling times and locations:	Continuous except when maintenance was required, or when calibrations and tests were performed		
Overall sampling strategy:	Air is sampled into a 3/8" o.d. teflon sampling line at a flow rate of 12 l/min and brought to a lab van located on the O2 deck, forward of the bridge. The inlet tip is located close to the sonic anemometer to facilitate eddy correlation analysis of the data.		
Expected initial data products:	Ozone concentration: raw 10 Hz (ftp://ftp.etl.noaa.gov/et6/cruises/GASEX 2008).		
Expected distributed data products, and time-frame for distribution:	10 min and hourly average of ozone flux, concentration and deposition velocity. Informations will be included in a single file with other fluxes calculated from the PSD air-sea flux system.		
Analytical method	The instrument relies on the established principle and techniques of the NO + O3 chemiluminescence reaction (NO + O3 → NO2 + O2 + photon). The air is pulled to a reaction chamber where the ozone reacts with the NO. A photomultiplier tube is used to count the number of photons during the reaction. With the use of an ozone generator, we convert the number of counts per seconde to an ambient ozone concentration.		
Instrument details	Instrument designed and built at the Institute of Arctic and Alpine Research (INSTAAR), University of Colorado.		
Operation Log			
Affected data	Comments	Julian Day	
3/2/2008 1400 GMT	Start atmospheric ozone flux measurement	62	
3/5/2008 1950-2000 GMT	Changed filter + lag time test	65	
3/5/2008 2000 GMT	Start calibration	65	
3/6/2008 0030 GMT	End calibration	66	
3/6/2008 1800 GMT	Changed filter	66	
3/7/2008 2330 GMT	Changed filter	67	
3/9/2008 0155-0205 GMT	Changed filter + lag time test	69	
3/10/2008 0155-0205 GMT	Changed filter + lag time test	70	
3/11/2008 0410-0418 GMT	Changed filter + lag time test	71	
3/12/2008 0457-0504 GMT	Changed filter + lag time test	72	
3/13/2008 0145-0151 GMT	Changed filter + lag time test	73	
3/14/2008 0150-0157 GMT	Changed filter + lag time test	74	
3/15/2008 0155 GMT	Changed filter	75	
3/16/2008 0155-0207 GMT	Changed filter + lag time test	76	
3/17/2008 0005GMT	Start calibration	77	
3/17/2008 0305GMT	End calibration	77	
3/17/2008 0304 GMT	Changed filter	77	
3/18/2008 0204-0210 GMT	Changed filter + lag time test	78	
3/19/2008 0330 GMT	Changed filter	79	
3/20/2008 0202-0209 GMT	Changed filter + lag time test	80	
3/21/2008 0300-0306 GMT	Changed filter + lag time test	81	
3/21/2008 2303 GMT	Changed filter	81	
3/23/2008 0300-0310 GMT	Changed filter + lag time test	83	
3/23/2008 1900 GMT	Start calibration	83	
3/23/2008 2140 GMT	End calibration	83	
3/23/2008 2135 GMT	Changed filter	83	
3/24/2008 2150 GMT	Changed filter	84	
3/26/2008 0200-0204 GMT	Changed filter + lag time test	86	
3/26/2008 2149-2201 GMT	Changed filter + lag time test	86	
3/28/2008 0026-0030 GMT	Changed filter + lag time test	88	
3/28/2008 0035-0330 GMT	Ozone sensor down	88	
3/28/2008 2015-2030 GMT	Ozone sensor down	88	
3/28/2008 2310-2315 GMT	Changed filter + lag time test	88	
3/29/2008 0027-0029 GMT	lag time test	89	
3/30/2008 0158-0204 GMT	Changed filter + lag time test	90	
3/30/2008 2210 GMT	Start calibration	90	
3/30/2008 0212 GMT	End calibration	90	

4/01/2008 0155-0158 GMT	Changed filter + lag time test	92
4/01/2008 2203-2211 GMT	Changed filter + lag time test	92
4/03/2008 0219-0230 GMT	Changed filter + lag time test	94
4/04/2008 0154-0200 GMT	Changed filter + lag time test	95
4/05/2008 0217-0224 GMT	Changed filter + lag time test	96
4/06/2008 0304-0310 GMT	Changed filter + lag time test	97
4/07/2008 1220 GMT	Changed filter. MFC won't restart. Will fix problem in port as weather is bad	98
4/07/2008 1230 GMT	Stop atmospheric ozone flux measurement	98