

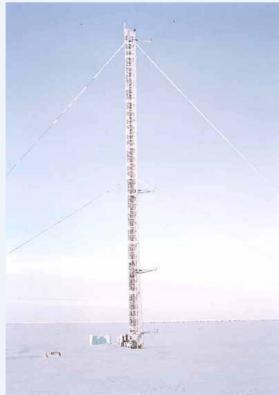
New ECOR Systems (TWP, NSA) and Surface Energy Balance Systems (SEBS)

SEBS Components



Surface Energy Balance System soil sensors, net radiometer, and wetness sensor.

NSA ECOR Tripod and Sites



Potential location of ECOR/SEBS near the 40-m Tower at NSA Barrow.



NSA ECOR/SEBS will be mounted on tripods placed on tundra mats. This view shows the tripod in an agricultural field.



Potential location of ECOR/SEBS at Point Barrow, near NSA Barrow.



Potential location of ECOR/SEBS at NSA Atkasuk. (Photo by Doug Whiteman, NSA).

DAVID R. COOK

Argonne National Laboratory
Argonne, Illinois

ABSTRACT

ECOR (eddy correlation) systems are being added to the Tropical Western Pacific (TWP) and North Slope of Alaska (NSA) ARM Climate Research Facilities (ACRF) to provide surface to air exchange measurements of heat, water vapor, and carbon dioxide. Furthermore, all ECOR systems, including those already installed at the Southern Great Plains (SGP) ACRF and in the ARM Mobile Facilities (AMF, AMF2), will be supplemented with a new instrument system (SEBS) that will allow the surface energy balance to be estimated.

This poster shows photos of some of the potential ECOR installation sites at TWP and NSA, and provides information on the new surface energy balance system.

APPLICATION

Energy balance closure is normally not achieved with ECOR measurements. The causes of this can be many, but recently some researchers have attempted to adjust ECOR measurements to produce a balance. This has sometimes been accomplished by evenly partitioning the "missing" energy into both sensible and latent heat fluxes. The energy balance, determined from a net radiometer and soil surface heat flux measurements, can be used as a guide in this process. Measurements from the SEBS will be incorporated into the ECOR VAP and thus provide one datastream from which the energy balance closure can be determined and the sensible and latent heat fluxes adjusted.

The equipment for the new ECOR systems and the new SEBS were purchased using ARRA funds.

SEBS

PURPOSE:

Provide an estimate of the surface energy balance for comparison to and as a supplement to the ECOR system measurements at SGP, TWP, NSA, AMF, and AMF2.

COMPONENTS:

CNR4 Precision Net Radiometer with CNF4 Ventilator
DRD-11A Wetness Sensor
STP-1 Soil Temperature Probes
SMP1 Soil Moisture Probes
HFT-3 Soil Heat Flow Transducers

DATA ACQUISITION:

CR1000-XT datalogger
AM16/32B-XT multiplexers.

ENCLOSURE:

SGP - enclosure (separate from the ECOR) attached to the triangular tower
AMF and AMF2 - integrated into the ECOR enclosure/module
NSA and TWP - ECOR and SEBS in same enclosure.

TWP ECOR Tower and Sites



TWP ECOR/SEBS systems will be mounted on the same triangular tower and boom arrangement used at the SGP. This view is of the SGP CF ECOR. (Photo by Chris Martin, SGP).



Potential location of ECOR/SEBS on the seashore near TWP Darwin.



Potential location of ECOR/SEBS in a grazing land near TWP Darwin.



Potential location of ECOR/SEBS in a grassland/wetland near TWP Darwin.



Potential location of ECOR/SEBS in a grassland near TWP Darwin.



Charles Darwin University ECOR system in a savanna near Darwin (data to be shared with ARM).

