Integrated Surface Flux System (ISFS)

ISFS is a highly-configurable suite of tower-based sensors used to study exchange processes between the atmosphere and Earth’s surface. This includes the direct measurement of fluxes of momentum, sensible and latent heat, trace gases, and radiation as well as standard atmospheric and surface variables. With multiple sensors and data systems, measurements of horizontal and vertical gradients also can be made. This facility has been used in Arctic to desert conditions with sensor spacings from 1 m to 60 km (and separations of 1000s of km are possible). Average statistics of all variables, including the second-order moments needed to compute fluxes, are a standard product of ISFS and are available in real-time for display. Every data sample is archived to allow processing using spectral, wavelet, or conditional sampling methods. ISFS also supports the addition of user-supplied sensors with digital or analog outputs at data rates up to 10,000 samples/s.

Applications
- Surface Energy Balance
- Turbulent Fluid Dynamics
- Dry Deposition of Trace Gases
- Basic Meteorology
- Spatial Variation of Surface Fluxes
- Vertical Gradients of Fluxes
- Flow Event Characterization
Integrated Surface Flux Facility

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http://www.eol.ucar.edu/isfs

Measurement Capabilities – most available at 10 or more different locations.

**Meteorology:**
- Wind speed, direction
- Temperature/relative humidity
- Pressure
- Precipitation

**Soil:**
- Temperature, Moisture, Heat flux
- Heat capacity, thermal diffusivity

**Fluxes:**
- Momentum, Sensible Heat
- Latent Heat
- Carbon dioxide
- User sensors

**Radiation:**
- Broad-band visible (in/out)
- Broad-band infrared (in/out)
- Net
- PAR
- Surface temperature
- Automated radiometer cleaning system

**Other:**
- GPS position/time/motion
- Flux-gate compass
- WWW camera

**Data Acquisition Capabilities:**
- Serial data to 230Kbaud (200 channels)
- Analog data, +/-5V, 16bit (40 channels)
- Data rates to 10,000 samp/s
- Relay control
- Microsecond time tag of every sample
- 4 Gb local data storage
- GOES data transmission at 1200 baud
- Ethernet/WiFi two-way communication
- Real-time data monitoring (communication dependent)

**Logistics:**
- AC power distribution to 2km
- Tripod, Triangular, Scaffolding towers from 3m to 30m
- Field office/laboratory trailer
- World-wide deployment

Requesting the ISFS

As with all EOL facilities, National Science Foundation-funded investigators may request use of the ISFS without charge, pending a panel review and final approval by NSF. Request applications are due 1 January and 1 July for experiments starting 10-16 months later.

For more information on how to request the ISFS, visit:
http://www.eol.ucar.edu/request-facilities

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