

CentNet—A deployable 100-station network for surface exchange research

Steven P. Oncley, NCAR, Boulder, CO; and S. Semmer, T. W. Horst, J. Militzer, G. Maclean, K. Knudson, and C. Golubieski

Observational research in the biogeosciences, hydrology, urban meteorology, basic meteorology, and turbulence would greatly benefit from a high-density network of surface measurements. NCAR/EOL is developing CentNet, which would have on the order of 100 surface flux stations deployable for periods of months to years. Each station would measure standard meteorological variables, all components of the surface energy balance (including turbulence fluxes and radiation), atmospheric composition, and other quantities to characterize the surface. This complement of sensors will also be deployable as intensive, highly-configurable spatial arrays, such as a set of micrometeorological profile towers

Our current development is focused on the use of sensor networks to increase spatial sampling at each station. When necessary, microprocessors are added to commercial sensors to provide any necessary control signals and to apply sensor calibrations. Two-way communication to each sensor is available to synchronize data streams and query sensor status. The data system saves every sample on site to retain flexibility in data analysis. With this approach, CentNet is adaptable to a wide variety of research problems while keeping operations manageable.