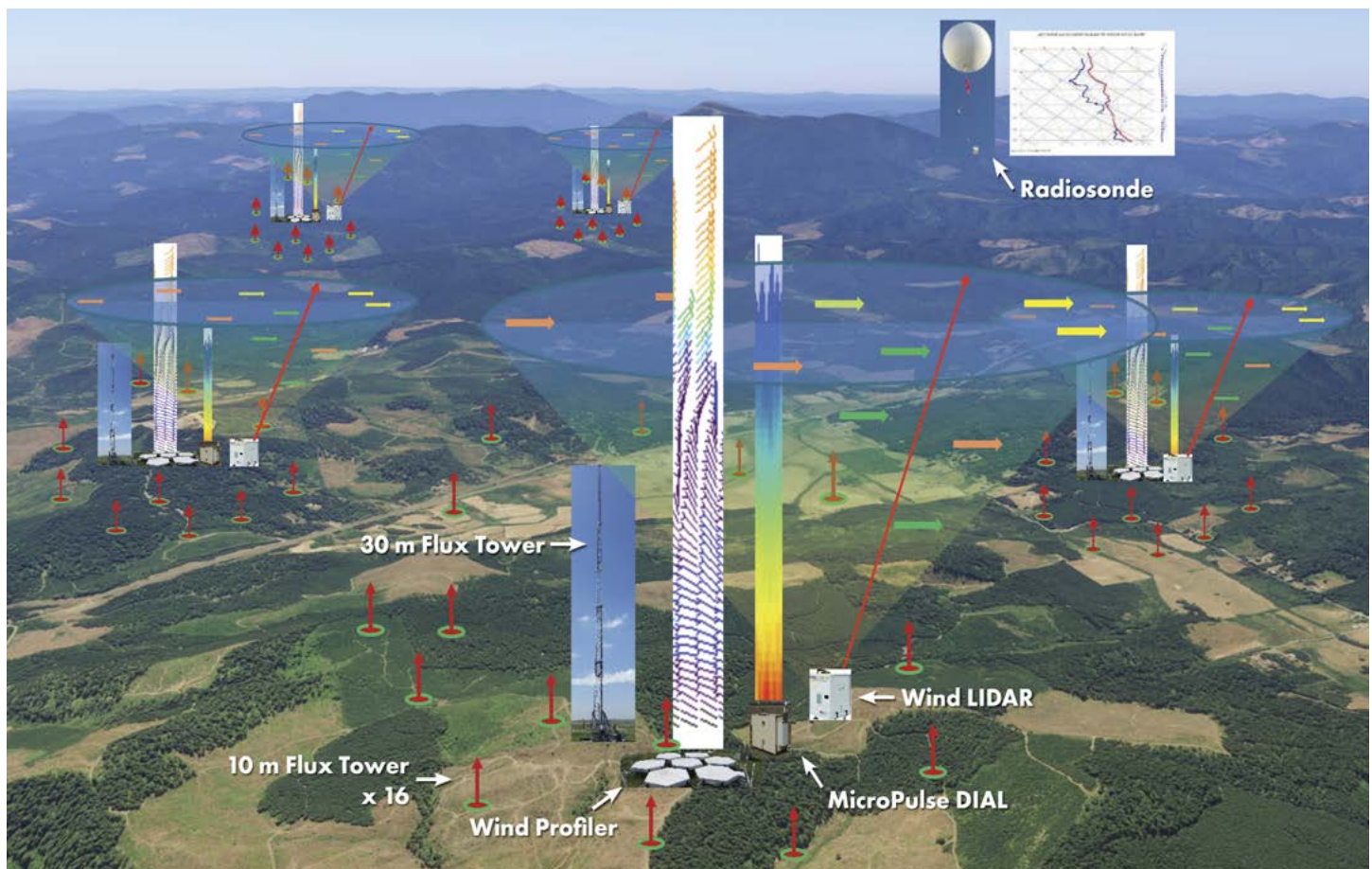


Lower Troposphere Observing System (LOTOS)

LOTOS is a proposed suite of instruments designed to address outstanding scientific challenges of processes within the atmospheric surface layer, boundary layer, and lower troposphere. The system will include five deployable nodes with full kinematic and thermodynamic profiling capability. Multiple sensors surround each node for surface and subsurface characterization and quantification of exchange processes. The network will simultaneously sample both horizontally and vertically as an integrated system, combining observations into an integrated data set. LOTOS will enable advancements on a wide array of Earth science challenges, including micrometeorological surface energy exchange, mesoscale convective initiation and evolution of precipitation and extreme weather, hydrological processes, urban and mountain meteorology, wind energy, biogeochemical fluxes, and climate processes.

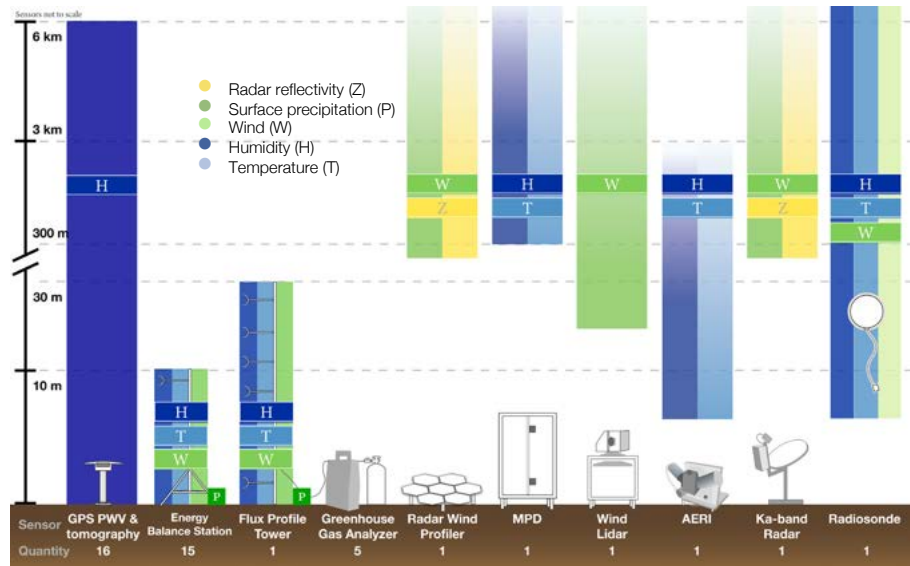


**DEVELOPMENT
PROJECT**





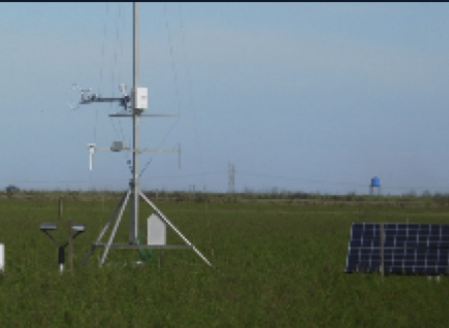
SENSORS OF ONE LOTOS NODE (5 TOTAL)



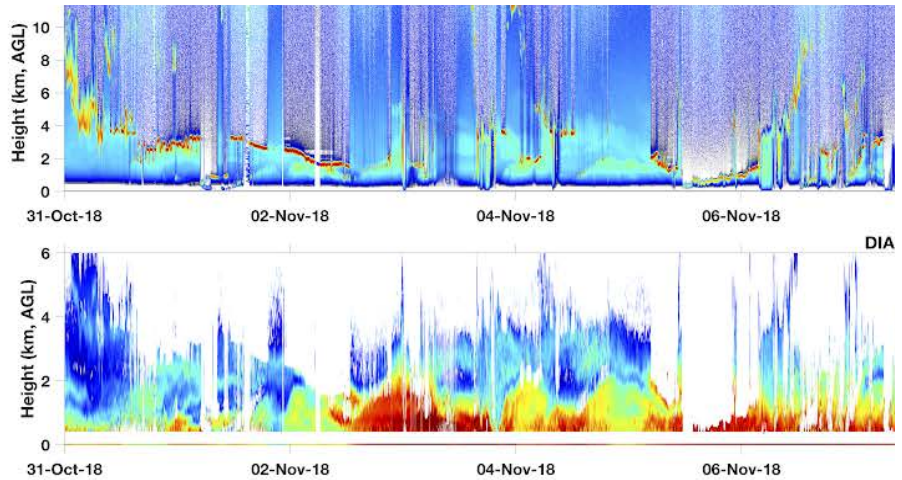
PROPOSED INSTRUMENTATION

- MicroPulse DIAL
- Modular Radar Wind Profiler
- Radiosonde System
- Ka-band Radar
- Scanning Wind Lidar
- Flux Profile Tower (30 m)
- Energy Balance Station (15 per node)
- Greenhouse Gas Analyzer
- AERI spectroradiometer
- GPS Water Vapor and Tomography

The five nodes of LOTOS each consist of an integrated suite of instruments to profile the boundary layer and lower troposphere. The nodes will be surrounded by up to fifteen flux stations to measure surface energy budget and greenhouse gas sampling. The integrated suites will produce quasi 3D observations of wind, temperature, water vapor, trace gases and fluxes, including CO₂ and CH₄. The five nodes will be highly configurable, for example, they can be deployed independently, in a line across an area of interest, or around a box whereby the spatial gradients of convergence and divergence can be examined. LOTOS will build on existing EOL instrumentation to produce a unique deployable integrated observing facility to make measurements from the microscale up to the mesoscale and further up to the regional scale. Intentional redundancy and complementary capabilities enable validation of sensor accuracy and real-time data quality monitoring. LOTOS will produce integrated datasets that can be assimilated into atmospheric models and rapidly analyzed.



MICROPULSE DIAL WATER VAPOR



An example of MicroPulse DIAL aerosol and water vapor measurements

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