

UAS Measurements

Baseline Measurements

	Instrumentation	Measurements
Aircraft State	Aircraft Integrated Meteorological Measurement System (AIMMS)-30, VectorNav (VN) 200	Ground velocity, true air speed, altitude, latitude, longitude, heading, and orientation (100 Hz)
Meteorological State	Aircraft Integrated Meteorological Measurement System (AIMMS)-30, CO ₂ /H ₂ O Gas Analyzer (Li-840)	Static pressure (1 Hz), static temperature (1 Hz & 50 Hz), RH (1 Hz), water vapor conc. (2 Hz), CO ₂ conc. (1 Hz), and 3D winds (100 Hz)
Flux Measurements	Aircraft Integrated Meteorological Measurement System (AIMMS)-30, Fast Temperature Sensor	Momentum (100 Hz)
Land Surface Properties	IR Thermometer, ALTUM Camera	Infrared surface temperature (1 Hz), panchromatic images, multispectral images at 475 nm, 560 nm, 668 nm, 717 nm, 842 nm, and thermal images at 10.5 mm. Imaged surface resolution at 3,000 ft AGL: 20 cm/px, 40 cm/px, and 250 cm/px, respectively.
Isokinetic Aerosol Inlet	PNNL-designed community inlet system	Sample line temperature and RH (1 Hz)

Switchable Aerosol Measurements

	Instrumentation	Measurements
Package 1: Aerosol Physicochemical Properties (1 Hz)	Advanced Mixing Condensation Particle Counter (MCPC)	Aerosol total number concentration (7 – 2,000 nm)
	Portable Optical Particle Spectrometer (POPS)	Aerosol size distribution (135 – 3,000 nm optical size)
	Miniaturized Optical Particle Counter (MOPC)	Aerosol size distribution (180 – 3,000 nm optical size)
	Cloud Droplet Probe (CDP)	Aerosol size distribution (2 – 10 μm optical size)
	Single Channel Tricolor Absorption Photometer (STAP)	Aerosol light absorption at 450 nm, 525 nm, and 624 nm
	Aerosol Filter Sampler	Eight samples for offline chemical analysis
Package 2: Aerosol Size Distribution (1 Hz)	Miniaturized Scanning Electrical Mobility Sizer (mSEMS, 15 secs/scan)	Aerosol size distribution (10 – 375 nm electrical mobility size)
	Portable Optical Particle Spectrometer (POPS)	Aerosol size distribution (135 – 3,000 nm optical size)
	Cloud Droplet Probe (CDP)	Aerosol size distribution (2 – 10 μm optical size)