

Meteorological Measurements at Terrestrial & Aquatic Sites

Measurement	Sensor	TERRESTRIAL SITES (frequency/location)			AQUATIC SITES (frequency/location)	
		Tower Top	Lower Levels	Soil Array	On Bank Met Station	Above Water Met Station
Global shortwave radiation	Kipp and Zonen CMP22 Pyranometer	1 Hz (only core sites)	⊘	⊘	⊘	⊘
Direct and diffuse shortwave radiation	Delta-T Devices SPN1 Sunshine Pyranometer	1 Hz	⊘	⊘	⊘	⊘
Net-shortwave and net-longwave radiation (4-component)	Hukseflux NR01 Net Radiometer	1 Hz	⊘	1 Hz (only longwave)	1 Hz	30 s
Photosynthetically Active Radiation (PAR)	Kipp & Zonen PQS 1 PAR Quantum Sensor (additional downward-facing sensor at tower top)	1 Hz	1 Hz	⊘	1 Hz	30 s
Photosynthetically Active Radiation (PAR) - quantum line	Licor LI-191-01 Quantum Line Sensor	⊘	⊘	1 Hz	⊘	⊘
Spectral sun photometer - calibrated sky radiances	CIMEL Electronique - CE318N-EBS9	15 min	⊘	⊘	⊘	⊘
Air temperature	Thermometrics Climate RTD 100 Ω Probe, housed within a Met One 076B fan aspirated radiation shield (triplet probes in tower top shield)	1 Hz	1 Hz	⊘	1 Hz	1 min
IR biological temperature	Apogee SI-111 infrared (IR) temperature sensor	⊘	1 Hz	1 Hz	⊘	⊘
Relative humidity	Vaisala HUMICAP Humidity and Temperature Probe - HMP 155	1 Hz	⊘	1 Hz	1 Hz	1 min
Barometric pressure	Vaisala - BAROCAP Digital Barometer PTB330	⊘	1 Hz	⊘	1 Hz	1 min
Precipitation/Primary - Double Fence Intercomparison Reference (DFIR)	Belfort AEPG II 600M weighing gauge	0.1 Hz (20 sites)			0.1 Hz (four sites)	
Precipitation/Secondary	Met One 372 tipping bucket (non-heated) and 379 tipping bucket (heated)	On event (37 sites)	⊘	⊘	On event (six sites)	⊘
Precipitation/Throughfall	Met One 372 tipping bucket (non-heated)	⊘	⊘	When event occurs	⊘	⊘
2D wind speed and direction	Gill - Wind Observer II; Extreme Weather Wind Observer; RM Young 05108-45 Wind Monitor-HD Alpine (buoy); Honeywell HMR 3330 (buoy)	⊘	1 Hz	⊘	1 Hz	~4 s
3D wind speed, direction and sonic temperature	Campbell Scientific. CSAT-3 3-D Sonic Anemometer	20 Hz	⊘	⊘	⊘	⊘
3D wind attitude and motion reference	Xsens North America Inc. MTI-300-2A5G4 Attitude Heading Reference System	40 Hz	⊘	⊘	⊘	⊘
CO ₂ and H ₂ O concentration & flux	LI-COR - LI7200 gas analyzer	20 Hz	⊘	⊘	⊘	⊘
CO ₂ and H ₂ O concentration (storage/profile)	LI-COR - LI840A	1 Hz	1 Hz	⊘	⊘	⊘
CO ₂ atmospheric isotopes (storage/profile)	PICARRO - G2131-i isotopic CO ₂ analyzer	1 Hz	1 Hz	⊘	⊘	⊘
H ₂ O atmospheric isotopes (storage/profile)	PICARRO - I2130-i isotopic H ₂ O analyzer	1 Hz (21 sites)	1 Hz (21 sites)	⊘	⊘	⊘
Wet deposition chemistry and precipitation isotopes	N- Con Systems Company Wet Deposition Collector, Manufacture Model No: NEON 00-127-7	2 wks (37 sites)	⊘	⊘	2 wks (seven sites)	⊘
Phenology images	Stardot NetCam SC CAM-SEC5IR-B	15 min	15 min	⊘	15 min	

Additional measurements only at D10 & D13 terrestrial sites (MOAB, ONAQ, NIWO, RMNP, STER, CPER):
Dust and particulate size distribution (TSI DustTrak model: 8533EP): 1 Hz; Particulate mass (Ecotech HiVol 3000): 2 wks