

Best practices checklist (updated 08/11/2020)

Weekly preventive maintenance

General checks

- Note arrival date/time to site;
- Conduct safety and work briefings with the team at the beginning of the work shift;

- Check for obstructions accessing the (wider) site especially after storm events;
- Be aware of animal activity (rodent burrows, wasps, insects, snakes);
- Check for obstructions accessing the tripod/tower (loose debris, wires, tubing);
- Check electrical systems are operating properly (e.g., after storm or animal damage);

- Document all changes that were done to dataloggers, sensors, gas cylinders, etc.;
- Note which instruments were cleaned;
- Check datalogger clocks, and document clock drift and adjustments made;
- Check for water or insect intrusion in sensors, enclosures, pumps, etc.;

- Ensure the shed, sensor enclosures are closed/locked before leaving the site;
- Note departure date/times from site;
- If remote communication is enabled, confirm access after each visit.

Tall canopy/tower site

- Inspect all PPE (personal protective equipment, e.g., harnesses, fall protection equipment, helmets) before each use;
- Ensure wearing hard hats when working near the tower;
- Check for damage to tower structure (breaks, cracks, or other problems);
- Check guy wires and anchoring system for proper tension, damage, or other issues;
- Check for loose hanging wires on the tower;
- Check for loose wires/tubing on the tower platforms (tripping hazard);
- Check whether hauling system ropes are tied down (if used);

Data acquisition system

- Check for error messages (operating system, logging/acquisition software, etc.);
- Download data and keep raw data separate from any other data;
- Check whether data-logging resumes after data download;
- Check if data are written to files correctly;
- Check if there is enough space available until the next data download or site visit.

Sites using a profile system

- Check the pressure of calibration gas cylinders (avoid using cylinders < 300 psi);
- Check tubings and filters;

- Check the radiation shield for dirt and bird droppings;
- Check the internal fans or pumps;
- Check the gas analyzer diagnostics and clean accordingly;
- Check measured values by the gas analyzer.

Sites using an open-path eddy flux system

- Check the sonic anemometer for bird droppings and other debris;
- Check the gas analyzer diagnostics and clean accordingly;
- Check measured values by the gas analyzer and sonic anemometer.

Sites using a closed-path eddy flux system

- Check the sonic anemometer for bird droppings and other debris;
- Check the gas analyzer diagnostics and clean accordingly;
- Check inlet filter;
- Check whether the inlet pump works properly;
- Check for any abnormal sound (i.e., leaks in tubes or gas cylinder);
- Check the pressure of calibration gas cylinders (avoid using cylinders < 300 psi).
- Check measured values by the gas analyzer and sonic anemometer.

Sites using soil respiration chambers

- Check for animal burrows/disturbance around chambers;
- Check for obstructions (twigs, debris) preventing the chamber lids from closing properly;
- Trim vegetation around chamber collar;
- Check gaskets around chamber lids;
- Check whether automatic chamber lids open and close on command;
- Confirm correct chamber name/number is allocated to the correct measurement plot;
- Download data and verify whether data are collected correctly after data download;
- Measure inner chamber collar depth if changes are expected during the season;
- Note time of gas sampling if manual measurements are collected.

Above- ground meteorological instrumentation

- Check all radiometers and PAR probes for dirt, bird droppings, leaves, scratches, etc.;
- Check whether the radiometer is clear of condensation or snow;
- Clean radiometer and PAR sensors;
- Check the leveling of radiometer and PAR sensors;
- Check whether the radiometer ventilation/heater is on/running if set up to do so;
- Check all temperature and relative humidity radiation shields for dirt, bird droppings;
- Check all other meteorological sensors for damage, dirt, deposits;
- Clean sensors following manufacturer recommendations.
- Check all measured values.

Belowground measurement instrumentation

- Check for animal activity/animal burrows around or near belowground measurement locations and/or damage to sensor cables;
- Inspect and clean debris at water table depth wells;
- Check all measured values.

Additional monthly preventive maintenance
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General checks

- Check cables/conduits/connectors for damage;

Tower/Tripod infrastructure

- Check for cracks, or other visible damages to structure (after storm, corrosion, etc.);
- Check guy wires and anchoring systems for proper tension, damage, or other issues.

Aboveground meteorological instrumentation

- Check the radiation shield for temperature and relative humidity is clean (dust, debris);
- Check the fan is spinning inside mechanically aspirated shield;
- Remove debris from the precipitation gages and run a validation check to ensure that the sensor is properly reporting data.

Belowground measurement instrumentation

- Check cables for signs of damage (rodents) and moisture intrusion.

Additional Seasonal / Semi-annual preventive maintenance

General checks

- Check site safety plan and update accordingly; (<https://ameriflux.lbl.gov/tech/safety/>);
- Check for obstructions or hazards to be flagged around the tower/tripod;
- Check if all rebars and any other pointy objects still have safety caps on;
- Check whether solar panels (if used) need to be inspected or replaced;
- Inspect and test batteries (especially for sites operating on solar panel power).

Tower maintenance:

- If tower/tripod infrastructure (including anchoring system) is due for a safety inspection, ensure this is happening before the start of the new season;
- Check whether guy ropes/wires and anchors are visually marked/flagged;
- Remove ropes if used as part of the hauling system;
- Check if climbing gear (harnesses, helmets, carabiners) and safety ropes are due for inspection, repairs or replacement and are stored correctly.

Sensors maintenance

- Check sensors to be calibrated following calibration interval recommendations;
- Remove broken and malfunctioning and no longer used sensors;
- Make sure all serial numbers and firmware versions are properly documented;
- Replace inlet filter on closed path gas analyzer (if left out over winter);
- Replace inlet tube if necessary;
- Verify orientation, separations and measurement heights of EC instrumentation;
- Check that BADM information in the AmeriFlux database is up-to-date.