

Introduction

The AmeriFlux Management Project Data Team provides data support to the carbon flux towers in the AmeriFlux network. The data services for AmeriFlux are receiving major upgrades. This poster provides highlights of the recently released and upcoming data changes. A few of the major categories of services include:

- Improved services to data contributors
- New data standards and formats
- Expanded data products and data access for users
- Data attribution and usage tracking capabilities
- Expansion of the network
- New data processing and QA/QC system
- Community workshops and outreach

AmeriFlux Site Pages and DOIs

The redesigned AmeriFlux site pages serve as the information hub for both users and data contributors. They provide access to site data and information update tools, DOI information, and data usage information.

The screenshot shows the AmeriFlux site page for the Harvard Forest EMS Tower (HFR). It includes a map of the site location, detailed site metadata (e.g., Name: US-Harvard Forest EMS Tower (HFR), Address: J. Weller Mungan, Harvard Forest, Harvard, MA, Latitude: 42.3276, Longitude: -71.7775), and various tabs for Site Characteristics, DOI, Data Use Log, Photo Gallery, and Publications. Below the main content is a detailed table of site parameters such as Mean Annual Temp (F), Mean Annual Precip (in), and Plant Species Measured.

AmeriFlux sites data DOIs provide a consistent citation and data usage tracking mechanism for users and data contributors. In the next few months, we will release a web interface to allow editing of the DOI authors for each site including specification of years of involvement.

Data Standards and Formats

The new FP Standard for flux/met data defines variable labels and file formatting for uploading continuously sampled data to AmeriFlux. The labels for the data variables have: a base name, indicating the measured or derived physical quantity or quality information, and qualifiers to the base names (e.g., positional information, quality flags, filtering states, gap-filling, processing methods, etc.). Qualifiers are always appended as suffixes to a variable base name. The specification can be found at <http://ameriflux.lbl.gov/data/aboutdata/>

Example base names:

| Variable | Unit | Description |
|-----------------|----------------------|--|
| TIMESTAMP | YYYYMMDDHHMMSS | ISO timestamp - short format |
| TIMESTAMP_START | YYYYMMDDHHMMSS | ISO timestamp start of averaging period - short format |
| TIMESTAMP_END | YYYYMMDDHHMMSS | ISO timestamp end of averaging period - short format |
| GAMPI | | |
| CO2 | ppmCO2_mol_1 | Carbon Dioxide (CO2) mole fraction |
| H2O | mmH2O_mmole_fraction | Water (H2O) mole fraction |
| Q4 | mmH2O_mmole_fraction | Methane (CH4) mole fraction |
| N2O | mmH2O_mmole_fraction | Nitrogen dioxide (N2O) mole fraction |
| NO2 | mmH2O_mmole_fraction | Nitrogen dioxide (NO2) mole fraction |

Example Qualifiers:

- _PI (Provided by PI/tower team)
- _QC (Standardized Quality control flag)
- _F (Gap-filled variable)
- _H_V_R (Three-index positional qualifier)

The FP-in format defines how to contribute data in FP Standard format. The new AmeriFlux BASE and FLUXNET2015 data products comply with FP Standard.

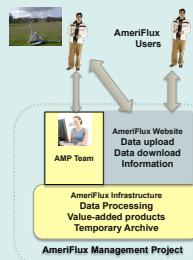
There are two key activities in the Biological, Ancillary, Disturbance, and Metadata (**BADM**). The standards define the variables, parameters, and units for the reporting of the data. We are currently completing version 3.0 of the BADM standards.

We are working on developing BADM reporting methods in collaboration with site teams using a user-centered design approach. Our initial reporting interface is now available via the web (accessible via the BADM tab on a site page). We will also be testing a mobile application.

The screenshot shows the BADM Editor interface. It includes sections for Site General Info (e.g., CA-Man: Monitors - Northern Old Black Spruce (former BOREAS Northern Study Area)), Site Characteristics, Measurements, and Processing. The Measurements section contains tables for GPP, Net Ecosystem Exchange (NEE), and Metabolic Variables.

Data Processing and QA/QC

This year, CDIAC withdrew from its role supporting AmeriFlux. We are working with CDIAC to transition existing data and QA/QC to the AmeriFlux Management Project. The new data flow diagram is shown on the right.

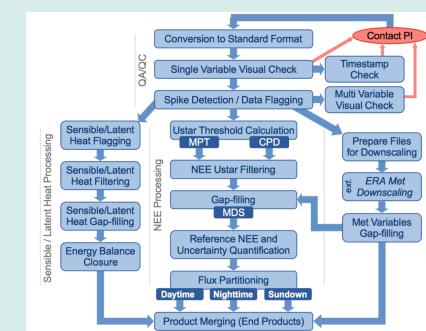


During this transition, we are revising the previous QA/QC to enable processing of FP-in files, to provide enhanced QA/QC, and to increase automation. A goal is improved feedback to the data contributors.

Gap-Filling, Partitioning, and Filtering

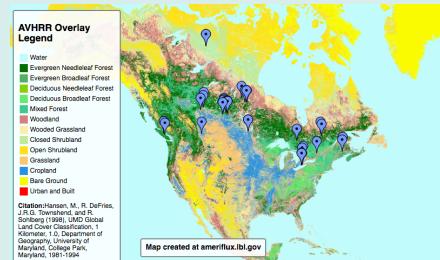
This past year we released the FLUXNET2015 dataset. This release brought a new level of consistency and capability. A next major upgrade to the processing pipeline is underway that will make the pipeline significantly more reliable and robust. This upgrade will also result in code that can be released as open source to allow community input.

We will use the new pipeline to produce the FLUXNET2017 dataset. After creation of FLUXNET2017, the plan is to generate FLUXNET datasets every 5 years. In the time between FLUXNET releases, the regional networks will produce datasets processed using the same pipeline.



Custom AmeriFlux Site Maps

The Custom Map feature can show a custom set of sites on a variety of landcover and Google map backgrounds. Here we show the Canadian Flux sites on the Advanced Very High Resolution Radiometer (AVHRR) Landcover image. The tool can be accessed at <http://wile.lbl.gov:8080/Maps/cartographer.html>



Data Workshops and Visits

The Data/Tech Workshop in 2016 was held at the Mountain Research Station, Colorado, and included a visit to Niwot Ridge. The new format was rated very highly by participants and will be carried forward into 2017 and beyond. In addition, we are investigating adding a data component to Tech Team site visits and work with sites on data processing.



Website and Contact

Website: <http://ameriflux.lbl.gov>
E-mail: ameriflux-support@lbl.gov

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