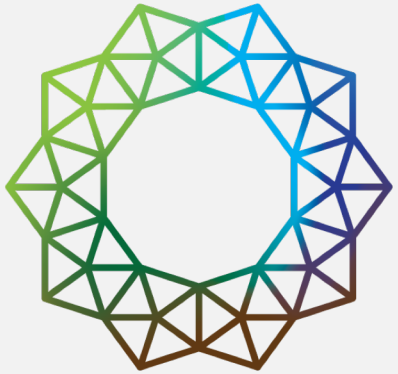

AMERIFLUX

AmeriFlux BASE Data Processing Pipeline

Danielle Svehla Christianson | AmeriFlux Management Project

Lawrence Berkeley National Laboratory | Data Science and Technology | Computational Research Division

Data-Tech Workshop | 29 Oct 2019

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U.S. DEPARTMENT OF ENERGY | Office of Science

BERKELEY LAB
Lawrence Berkeley National Laboratory

AmeriFlux Data Products: BASE + BIF → ONEFlux / Fluxnet

flux-met

BADM

BASE+
(QA/QC'ed flux-met data)

BIF
(QA/QC'ed BADM**)

ONEFlux / Fluxnet
(flux-met with gap-fill, uncertainty, partitioning)

+ Measurement Height temporary product

**BADM = Biological, Ancillary, Disturbance, & Metadata

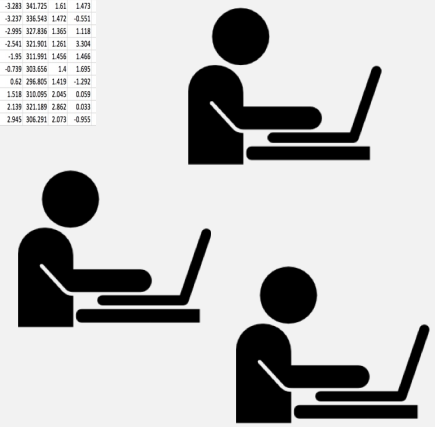
Goal: Synthesize flux-met data from across network to standard product

BASE Data Processing Pipeline

BASE

(FP Standard)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.695	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	



FP-In format is required for submission; FP Standard output (BASE)

https://ameriflux.lbl.gov/half-hourly-hourly-data-upload-format/

BASE-In
(FP-In)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	5
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

BASE Data Processing Pipeline

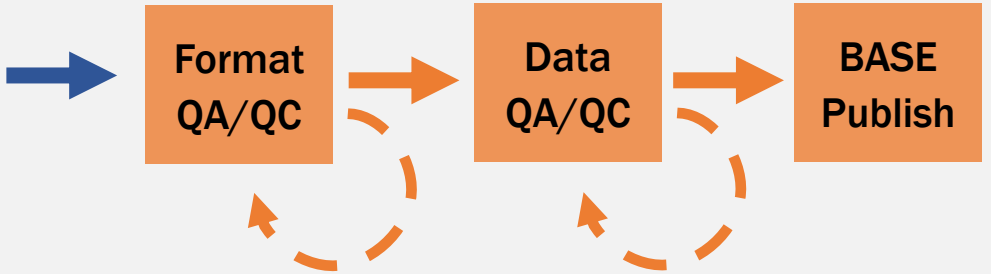
BASE
(FP Standard)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	5
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

Three modular processing steps

BASE-In
(FP-In)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	



BASE
(FP Standard)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

Format QA/QC checks for compliance with FP-In standard

BASE-In
(FP-In)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

Is data file format in FP-In?

Format QA/QC → **Data QA/QC** → **BASE Publish**

BASE
(FP Standard)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
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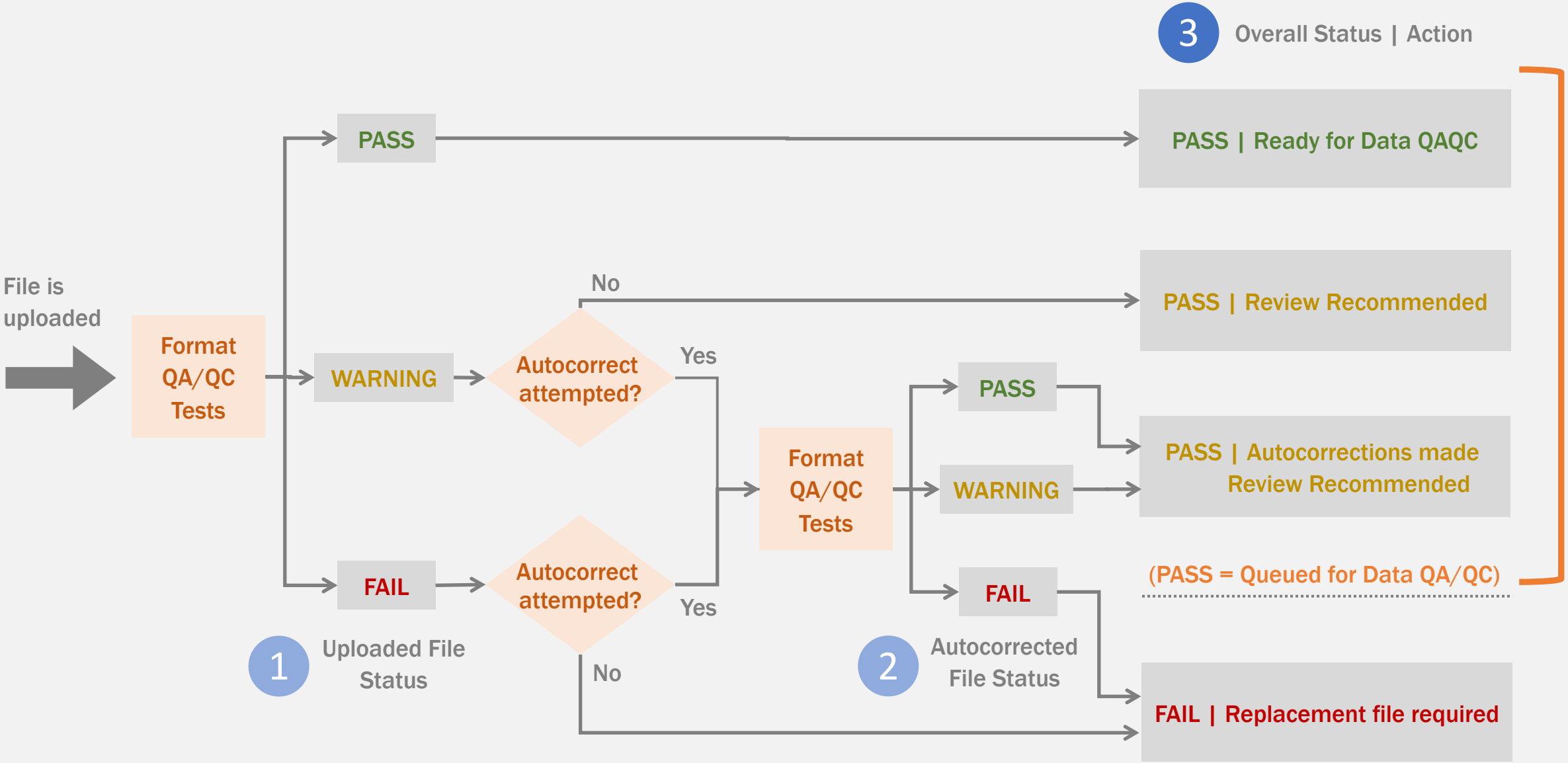
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

One attempt to autocorrect for minor issues

Iterative process for data provider

Automated Format QA/QC processing



Automated Format QA/QC email

AmeriFlux TESTQAQC-2712 Format Results - Review recommended | US-PFa data uploaded on Sep 11, 2017 Inbox ×

Danielle Christianson amp.data.qaqc@gmail.com via berkeley.edu Sun, Aug 11, 2:22 AM

to dsvehla

Dear Ankur Desai,

Thank you for uploading data for US-PFa on Sep 11, 2017.

Format QA/QC results

US-PFa_HR_199501010000_199601010000.csv:

- **PASS | Review Recommended.**
- Read details in this report: https://ameriflux.staging.wpengine.com/qaqc-report/?site_id=US-PFa&report_id=9424

US-PFa_HR_199601010000_199701010000.csv:

- **PASS | Review Recommended.**
- Read details in this report: https://ameriflux.staging.wpengine.com/qaqc-report/?site_id=US-PFa&report_id=9425

US-PFa_HR_199701010000_199801010000.csv:

- **PASS | Review Recommended.**
- Read details in this report: https://ameriflux.staging.wpengine.com/qaqc-report/?site_id=US-PFa&report_id=9426

Automated Format QA/QC on-line report

QA/QC Report: Format

This report details results of the AmeriFlux QA/QC data processing pipeline.
For more information, see How to Read This Report, QA/QC Results Definitions, and Upload Format Instructions

3

PASS **Autocorrections made. Review recommended.**
No further action needed if Autocorrected file is OK.

The following automated corrections were attempted. Please review.
No further action needed if corrections are OK. Upload a replacement file is something is amiss.

- Fixed invalid variable name TIMESTAMP_END with TIMESTAMP_END: whitespace removed
- File was AutoRepaired and repaired file uploaded.

Autocorrections

2

PASS Autocorrected File: US-UMB_HH_200701010000_201710230000.csv Report ID: 14473

Site ID: US-UMB
Site contact: Christopher Gough

Uploader: AMP Data Team (original file uploaded by Andres Camilo Rey Sanchez)
Upload date: 2018-Jun-20 13:51
Uploaded filename: US-UMB_HH_200701010000_201710230000-2018062912283974.csv

Format QA/QC report summary:
All format QA/QC checks attempted. No issues were encountered. Data will be queued for further data processing.

Test Results

Test	Result(s)	Additional Information
All Format QA/QC tests passed.		

Variable names found in the file:
TIMESTAMP_START, TIMESTAMP_END, USTAR, TA, WD, WS, H, LE, P, RH, PA, CO2, H2O, PPFD_IN, PPFD_DIF, NETRAD, SW_IN, SW_OUT, LW_IN, LW_OUT, FC, SC, NEE, NEE_F, RECO, RECO_F, GPP, TS_1_1_1, TS_1_2_1, TS_1_3_1, TS_1_4_1, TS_1_5_1, TS_1_6_1, TS_1_7_1, TS_1_8_1, SWC_1_1_1, SWC_1_2_1, SWC_1_3_1, SWC_1_4_1, SWC_1_5_1, SWC_1_6_1, SWC_1_7_1, SWC_1_8_1

Processing code version: 0.4.19
Processing log file: http://ameriflux-data.lbl.gov/QAQCLogs/QAQC_report_US-UMB_14473_20180629122841.log

1

FAIL Uploaded File: US-UMB_HH_200701010000_201710230000.csv Report ID: 14472

Autocorrection examples

The following automated corrections were attempted. Please review.
No further action needed if corrections are OK. Upload a replacement file is something is amiss.

- Fixed invalid variable name TIMESTAMP_END with TIMESTAMP_END: whitespace removed
- File was AutoRepaired and repaired file uploaded.

The following automated corrections were attempted. Please review.
No further action needed if corrections are OK. Upload a new file if something is amiss.

- NOTE un-fixable variable names: YY_LST_mid; MO_LST_mid; DD_LST_mid; HH_LST_mid; MM_LST_mid; SS_LST_mid; DOY_LST_mid; SB_BOLE_1; SB_FOILAGE_1
- Filename component fixed: optional parameter (ver.2019.06.13) removed from filename
- File was AutoRepaired and repaired file uploaded.

Test Result examples

Test	Result(s)	Additional Information
Are Data Variable names in correct format?	WARNING	These variable names are not in standard AmeriFlux format: **YY_LST_MID, MO_LST_MID, DD_LST_MID, HH_LST_MID, MM_LST_MID, SS_LST_MID, DOY_LST_MID, SB_BOLE_1, SB_FOILAGE_1**. They will not be included in the standard AmeriFlux data products. Non-standard variables will be saved for a non-standard data product that will be available in future.
Any Variables suspected gap-fill?	WARNING	These variables are suspected to be gap-filled because they have no missing values: YY_LST_MID, MO_LST_MID, DD_LST_MID, HH_LST_MID, MM_LST_MID, SS_LST_MID, DOY_LST_MID, G_1, RH_1_3_1, T_BOLE_1, T_BOLE_2, T_BOLE_3
Any Variables with ALL Data Missing?	WARNING	These variables have all data missing: **SC_1_1_1, SH_1_1_1, SLE_1_1_1, P_1_1_1**. Previously uploaded data with the same time period will be overwritten.

Test Result examples

Test	Result(s)	Additional Information
Any Timestamp duplicates?	FAIL	**1** duplicate timestamps found in TIMESTAMP_START **1** duplicate timestamps found in TIMESTAMP_END
Is Timestamp resolution OK?	FAIL	**52608** timestamps in in TIMESTAMP_START with invalid resolution between rows **52608** timestamps in in TIMESTAMP_END with invalid resolution between rows **1** timestamp in with invalid resolution within rows
Issues that cannot be autocorrected.	FAIL	Unable to validate timestamps for 52608 lines (including any duplicated timestamps reported above). These lines were removed. Gap-filling may have occurred to fill any resulting missing timestamps. However more than 10% of file data was changed and QA/QC will not be continued. File had issues that could not be automatically fixed. AutoRepair FAILED.
Are Data Variable names in correct format?	WARNING	These variable names are not in standard AmeriFlux format: **YEAR, DOY, HRMIN, DTIME**. They will not be included in the standard AmeriFlux data products.
Any Variables suspected gap-fill?	WARNING	These variables are suspected to be gap-filled because they have no missing values: YEAR, DOY, HRMIN, DTIME
Autocorrections that can be attempted if failed issues are addressed in replacement file.	WARNING	NOTE un-fixable variable names: YEAR; DOY; HRMIN; DTIME Filled 1 timestamp gap with missing data values (-9999).

Data QA/QC is run if…

~1 year of data is submitted

No pending Format QA/QC issues

No large data gaps (e.g., missing years of data)

Time periods with previously identified data issues are re-submitted

Data QA/QC checks data issues

BASE-In
(FP-In)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

Does data pass quality checks?

Format QA/QC

Data QA/QC

BASE Publish

BASE
(FP Standard)

TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	371.117	0.424	0.065	-1.049	124.224	1.39	-0.287	
200401010200	200401010230	-9999	-9999	-9999	-1.109	-9999	-9999	-9999	
200401010230	200401010300	372.87	0.106	0.054	-2.228	8.094	1.387	-0.145	
200401010300	200401010330	373.339	0.406	0.066	-2.525	24.062	1.483	0.738	
200401010330	200401010400	373.661	1.225	0.013	-2.287	24.261	1.763	1.639	
200401010400	200401010430	374.326	0.847	0.029	-2.483	42.956	1.259	1.395	
200401010430	200401010500	-9999	-9999	-9999	-1.829	-9999	-9999	-9999	
200401010500	200401010530	374.452	0.908	0.066	-2.456	199.948	1.393	1.497	
200401010530	200401010600	-9999	-9999	-9999	-2.668	-9999	-9999	-9999	
200401010600	200401010630	375.59	1.015	0.061	-2.986	342.969	1.548	2.051	
200401010630	200401010700	378.311	0.78	0.024	-3.377	311.023	1.015	3.541	
200401010700	200401010730	382.137	0.49	0.117	-3.283	341.725	1.61	1.473	
200401010730	200401010800	380.643	0.642	0.127	-3.237	336.543	1.472	-0.551	
200401010800	200401010830	379.306	0.767	0.113	-2.995	327.836	1.365	1.118	
200401010830	200401010900	381.477	1.785	0.137	-2.541	321.901	1.261	3.304	
200401010900	200401010930	382.918	1.554	0.217	-1.95	311.991	1.456	1.466	
200401010930	200401011000	381.267	2.239	0.279	-0.739	303.656	1.4	1.695	
200401011000	200401011030	381.616	-0.077	0.352	0.62	296.805	1.419	-1.292	
200401011030	200401011100	378.344	2.476	0.55	1.518	310.095	2.045	0.059	
200401011100	200401011130	375.78	1.187	0.566	2.139	321.189	2.862	0.033	
200401011130	200401011200	375.55	-0.229	0.522	2.945	306.291	2.073	-0.955	

All data periods are combined.

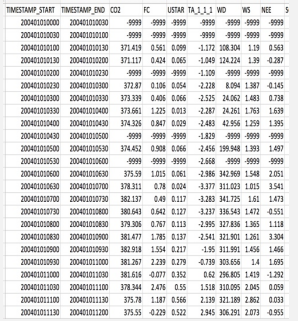
Non-standard variables removed.

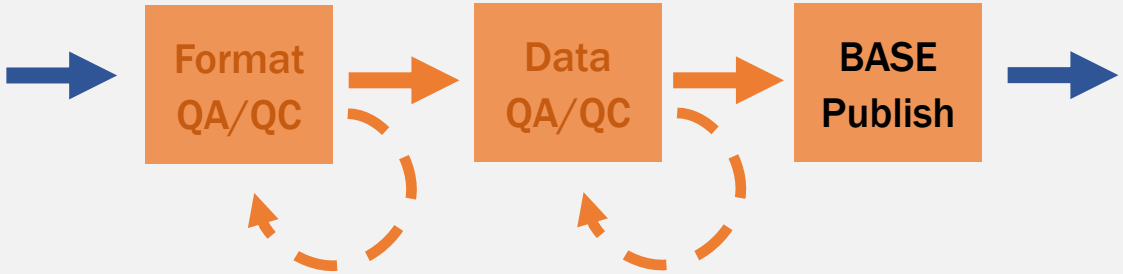
Data QA/QC Assessment:

- Automated checks + figure generation
- Housen synthesizes report and sends email

BASE data product made available online

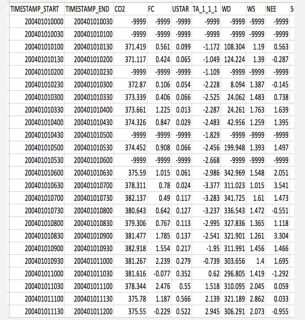
BASE-In
(FP-In)





BASE Data Product
available w/ DOI

BASE
(FP Standard)



- Add _PI qualifier
- Add version: data_version-processing_code_version (e.g., 10-5)
- Bundle with site's BADM data into zip file
- Generate DOI (if first publish)
- Generate Measurement Height (temporary) data file

DOI (Data Object Identifier) available on Site Info page

https://ameriflux.lbl.gov/sites/siteinfo/<site_id>#doi

US-ARM: ARM Southern Great Plains site- Lamont

Overview	Windroses	DOI	Data Use Log	Image Gallery	MODIS	Publications	BADM

Instructions for DOIs for This Site

When using DOIs for this site, use the publications and acknowledgments listed below.

DOIs

- **AmeriFlux**

  Citation: Sebastien Biraud AmeriFlux US-ARM ARM Southern Great Plains site- Lamont, doi:10.17190/AMF/1246027
  Link: http://dx.doi.org/10.17190/AMF/1246027

Publications to use for Citations for this Site

- Fischer, M. L., Billesbach, D. P., Berry, J. A., Riley, W. J., Torn, M. S. (2007) Spatiotemporal Variations In Growing Season Exchanges Of Co2, H2o, And Sensible Heat In Agricultural Fields Of The Southern Great Plains, Earth Interactions, 11(17), 1-21.

Acknowledgements

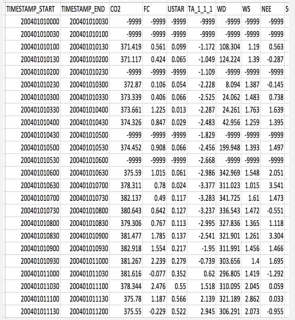
- This research was supported by the Office of Biological and Environmental Research of the US Department of Energy under contract No. DE-AC02-05CH11231 as part of the Atmospheric Radiation Measurement Program (ARM)

Resources

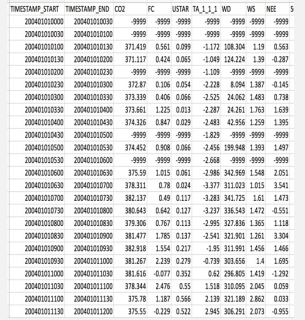
- **AmeriFlux** Logos & Acknowledgments

BASE data product made available online

BASE-In
(FP-In)



BASE
(FP Standard)



Data provider tools:

- Data Processing Status
- JIRA portal
- Data Download Log

Data Processing Status (have to be listed as team member)

https://ameriflux.lbl.gov/sites/data-processing-status/

Data Processing Status

Use the table below to determine which sites have data that require action.

Key:
▼ = Site Team action required
✓ = Complete

Site (Filter)	Published Version	Progress	Status
US-Snd	2-1	●●○○○	Ready for Data QA/QC
US-Tw2	1-1	●●○○○	Ready for Data QA/QC
US-Ton	9-1	●○○○○ ▼	Format issues: Waiting for Tower Team
US-Var	9-1	●○○○○ ▼	Format issues: Waiting for Tower Team
US-Bi1		●●○○○	Ready for Data QA/QC
US-Twt	6-4	●●●●● ✓	Published as version 6-4
US-Tw1	4-4	●●●●● ✓	Published as version 4-4

Data Processing Status (have to be listed as team member)

https://ameriflux.lbl.gov/sites/data-processing-status/

Data Processing Status

Use the table below to determine which sites have data that require action.

Key:
▼ = Site Team action required
✓ = Complete

Statuses

Symbol	Status
●○○○○	Format issues: Waiting for AmeriFlux Data Team
●○○○○ ▼	Format issues: Waiting for Tower Team
●●○○○	Ready for Data QA/QC
●●●○○	Data issues: Waiting for AmeriFlux Data Team
●●●○○ ▼	Data issues: Waiting for Tower Team
●●●●○	Data ready to be published
●●●●● ✓	Data Products Up-to-Date

Site	Published Version	Progress	Issue	Last Activity	Uploader
Filter					Filter
US-Snd	2-1	●●○○○	QAQC-666	2017-08-30	AmeriFlux Data Team
US-Tw2	1-1	●●○○○	QAQC-649	2017-08-30	AmeriFlux Data Team
US-Ton	9-1	●○○○○ ▼	QAQC-553	2017-08-17	Siyan Ma
US-Var	9-1	●○○○○ ▼	QAQC-409	2017-07-31	Siyan Ma
US-Bi1		●●○○○	QAQC-1457	2018-02-27	Daphne Szutu
US-Twt	6-4	●●●●● ✓	QAQC-1308	2018-01-31	Elke Eichelmann
US-Tw1	4-4	●●●●● ✓	QAQC-1307	2018-01-31	Elke Eichelmann

JIRA portal

Data Download Log (via Site Info page)

https://ameriflux.lbl.gov/sites/siteinfo/<site_id>#data-use-log

US-ARM: ARM Southern Great Plains site- Lamont

Overview | Windroses | DOI | Data Use Log | Image Gallery | MODIS | Publications | BADM

This page displays the list of downloads of data for the site US-ARM.

NOTE: Version refers to the version of the AmeriFlux BASE-BADM product for the site was downloaded by the user and the download count indicates the number of times the person downloaded that version. The download count indicates the number of times the person downloaded the data.

Export to Excel | Export to CSV

Year Range Start Year - Search

Showing 1 to 10 of 2340 results

Products

First < 1 > Last

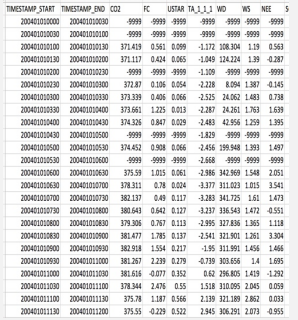
All BASE FLUXNET2015 LaThuile 2007

Items Per Page: 10 25 50 View All

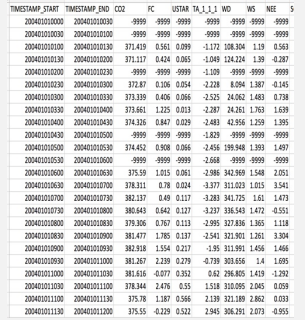
Date	Name	Product	Version	Intended Use	Intended Use Description	Download Count
2019-07-27	zhang ji	FLUXNET2015	1-3	Research - Remote sensing	sadasd	1
2019-07-23	Mario Mhawej	BASE	8-5	Research - Remote sensing	ET validations	1
2019-07-23	Hongkai Gao	BASE	8-5	Research - Other	see the CV of ET	3
2019-07-22	Meredith Reitz	BASE	8-5	Research - Other	Preliminary analysis for data to possibly be used for model test	2

BASE data product made available online

BASE-In
(FP-In)



BASE
(FP Standard)



User tools include:

- Data Change Log
- Data Availability by site
- Search sites by variables in specific years
- Data Download

Data Change Log

Data Change Log – AmeriFlux

This page lists updates and changes to site data across releases of the new forr
https://ameriflux.lbl.gov. For further information, check the site pages (linked to t

Notes:

- Beginning August 2018, files with processing version 5 or greater will ha
variable name for aggregated variables submitted by the site team. The
added to ecosystem data products (GPP, NEE, RECO, and VPD) and gap
site team.
- As of April 2016, all sites with BADM data will be using the new BIF form
https://ameriflux.lbl.gov/badm-data-product/.

Errata: Files released in September 2017 (processing version 3) had a bug that r
headers. This has been corrected in processing version 4. We recommend data
the impacted sites.

August 2019

New Sites Added	BR-CST	US-DPW	US-Fcr	US-Hn2	US-K
Updated Sites	CA-Ojp US-Mpj US-Pnp US-SP4 US-Vcp	US-ARM US-Myb US-Ro4 US-Ton US-Vcs	US-Bi2 US-NC4 US-Ro5 US-Tw1 US-WCr	US-CRT US-NGB US-Ro6 US-Uaf US-Wjs	US-H US-N US-S US-U US-W

June 2019

New Sites Added	AR-TF1 US-PHM	AR-TF2	CA-DBB	US-EDN	US-H
Updated Sites	US-ALQ	US-MMS	US-NC2	US-NC3	

April 2019

New Sites Added	US-CF1	US-CF2	US-CF3	US-CF4	US-H
Updated Sites	BR-Sa3 CA-NS6 US-ARM US-Los US-Ro5 US-Var	CA-Cbo CA-NS7 US-Blo US-LWW US-Ro6 US-Vcm	CA-NS1 CA-Qfo US-Cop US-MOz US-Rws US-Vcp	CA-NS2 US-A03 US-GLE US-PFa US-SRC US-Vcs	CA-N US-A10 US-Goo US-Rls US-Tw4 US-WCr

	US-ARb	US-ARc	
	US-Ho1	US-Lin	
	US-Rms	US-Ro4	
	US-UMB	US-UMd	

August 2019

New Sites Added	BR-CST	US-DPW	US-Fcr	US-Hn2	US-KS3	US-xHA	US-xKZ
Updated Sites	CA-Ojp US-Mpj US-Pnp US-SP4 US-Vcp	US-ARM US-Myb US-Ro4 US-Ton US-Vcs	US-Bi2 US-NC4 US-Ro5 US-Tw1 US-WCr	US-CRT US-NGB US-Ro6 US-Uaf US-Wjs	US-Ha1 US-NMj US-Seg US-Upa US-WPT	US-Los US-NR1 US-Ses US-Var	US-MMS US-Oho US-SFP US-Vcm

June 2019

New Sites Added	AR-TF1 US-PHM	AR-TF2	CA-DBB	US-EDN	US-Hn3	US-LA1	US-LA2
Updated Sites	US-ALQ	US-MMS	US-NC2	US-NC3			

April 2019

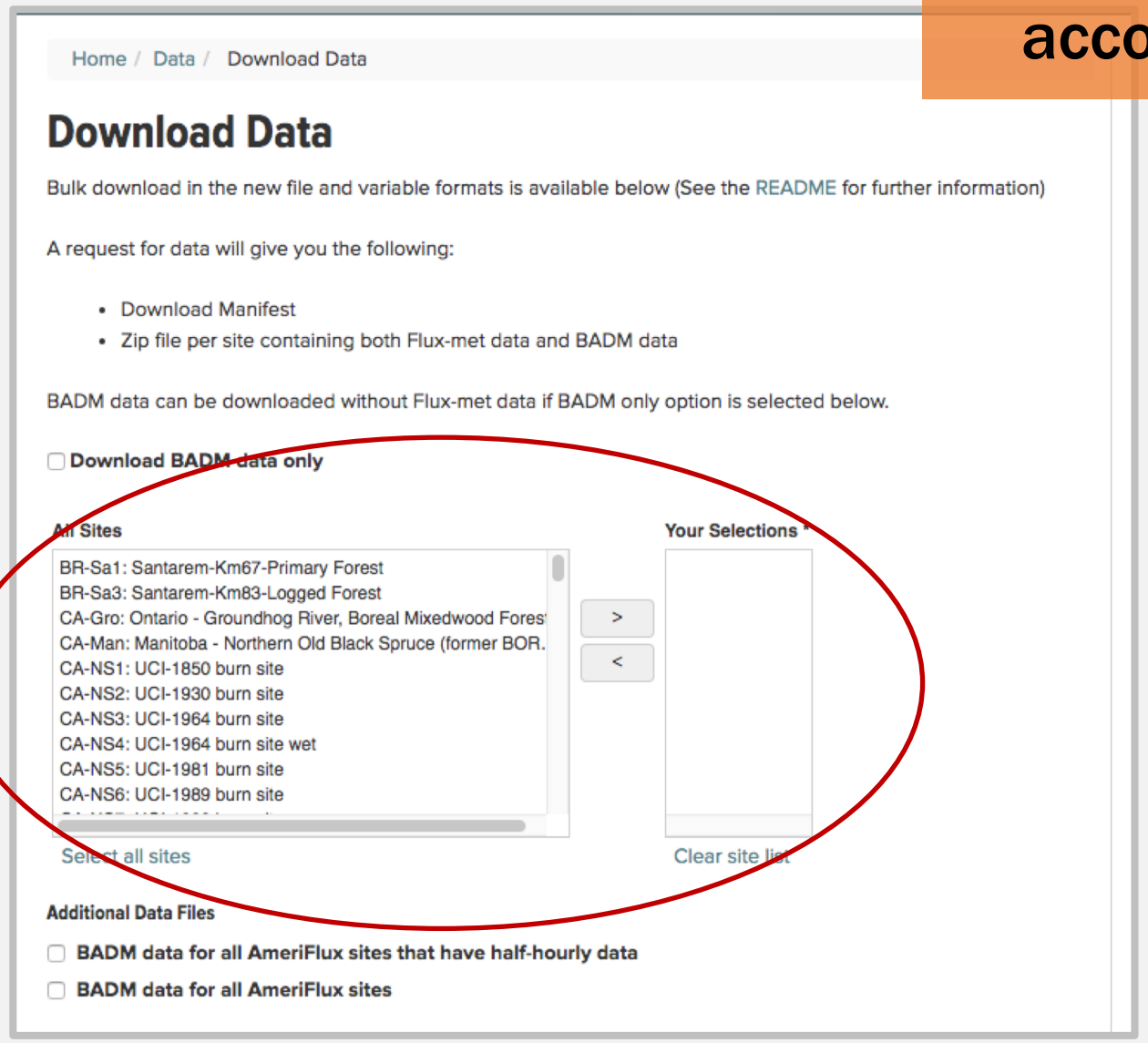
New Sites Added	US-CF1	US-CF2	US-CF3	US-CF4	US-HRA	US-HRC	US-Tw5
Updated Sites	BR-Sa3 CA-NS6 US-ARM US-Los US-Ro5 US-Var	CA-Cbo CA-NS7 US-Blo US-LWW US-Ro6 US-Vcm	CA-NS1 CA-Qfo US-Cop US-MOz US-Rws US-Vcp	CA-NS2 US-A03 US-GLE US-PFa US-SRC US-Vcs	CA-NS3 US-A10 US-Goo US-Rls US-Tw4 US-WCr	CA-NS4 US-ARb US-Ho1 US-Rms US-UMB	CA-NS5 US-ARc US-Lin US-Ro4 US-UMd

Hover over site to see version

Download Data

https://ameriflux.lbl.gov/data/download-data/

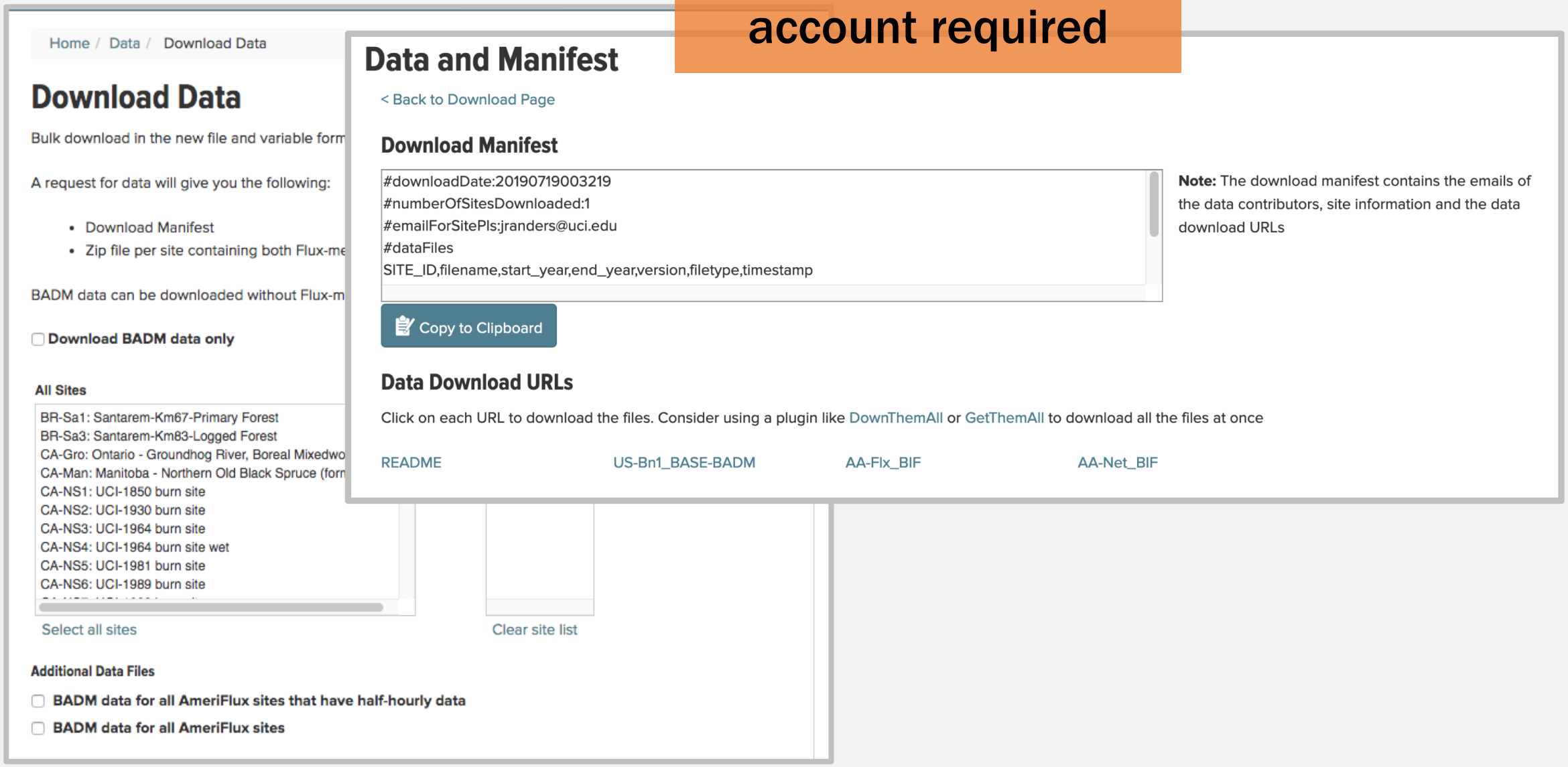
AmeriFlux / Fluxnet account required



Download Data

https://ameriflux.lbl.gov/data/download-data/

AmeriFlux / Fluxnet account required



Measurement Height

https://ameriflux.lbl.gov/data/measurement-height/

Measurement Height

Measurement Height contains height/depth and instrument model information for AmeriFlux BASE data products.* This information is updated approximately once a month, in conjunction with new BASE releases.

Measurement Height is a temporary data product b
upgraded. The downloaded csv file contains inform
Site teams can update their Measurement Height i

Download BASE Measurement Height

Safari and Chrome users: *To download the file, co*
Linked File As" or "Save Link As", and specify a de

Measurement Height contains the following infor

Item	Description
Site_ID	Site identifier.
Variable	Variable name of the data included in the BASE file.
Start_Date	Date when the information first applies. No value means the information begins at the start of the site's full data record.
Height	Distance from the ground surface in meters. Positive values are heights, and negative values are depths.
Instrument_Model	Instrument model used to collect the data variable. These values are from the predefined BADM Instrument list for instrument model types. See LIST(Vocabulary) tab in the BADM

BASE_MeasurementHeight_20190614

Home Insert Page Layout Formulas Data Review View

A2533 | US-Ha1

	A	B	C	D	E	F	G	H
1	Site_ID	Variable	Start_Date	Height	Instrument_Model	Instrument_Model2	Comment	BASE_Version
2512	US-Ha1	H		29	SA-ATI SATI K Style			11-5
2513	US-Ha1	H2O		29	GA_CP-LI-COR LI-6262		Licor CO2/H2O sensor	11-5
2514	US-Ha1	LE		29	SA-ATI SATI K Style	GA_CP-LI-COR LI-6262		11-5
2515	US-Ha1	NEE_PI		29	SA-ATI SATI K Style	GA_CP-LI-COR LI-6262		11-5
2516	US-Ha1	NEE_PI_F		29	GA_CP-LI-COR LI-6262	SA-ATI SATI K Style		11-5
2517	US-Ha1	O3			GA-Other			11-5
2518	US-Ha1	PPFD_IN_1_1_1		29	RAD-PAR Quantum			11-5
2519	US-Ha1	PPFD_IN_2_1_1	20120422	29	RAD-PAR Quantum			11-5
2520	US-Ha1	PPFD_IN_1_2_1		12.7	RAD-PAR Quantum			11-5
2521	US-Ha1	PPFD_IN_PI_F_1_1_1		29	RAD-PAR Quantum			11-5
2522	US-Ha1	PPFD_DIF	20120422	29	RAD-PAR Quantum			11-5
2523	US-Ha1	P			RAIN-TipBucGauge			11-5

Next steps

More automation: Data QA/QC

Non-standard data variables data product

NetCDF format

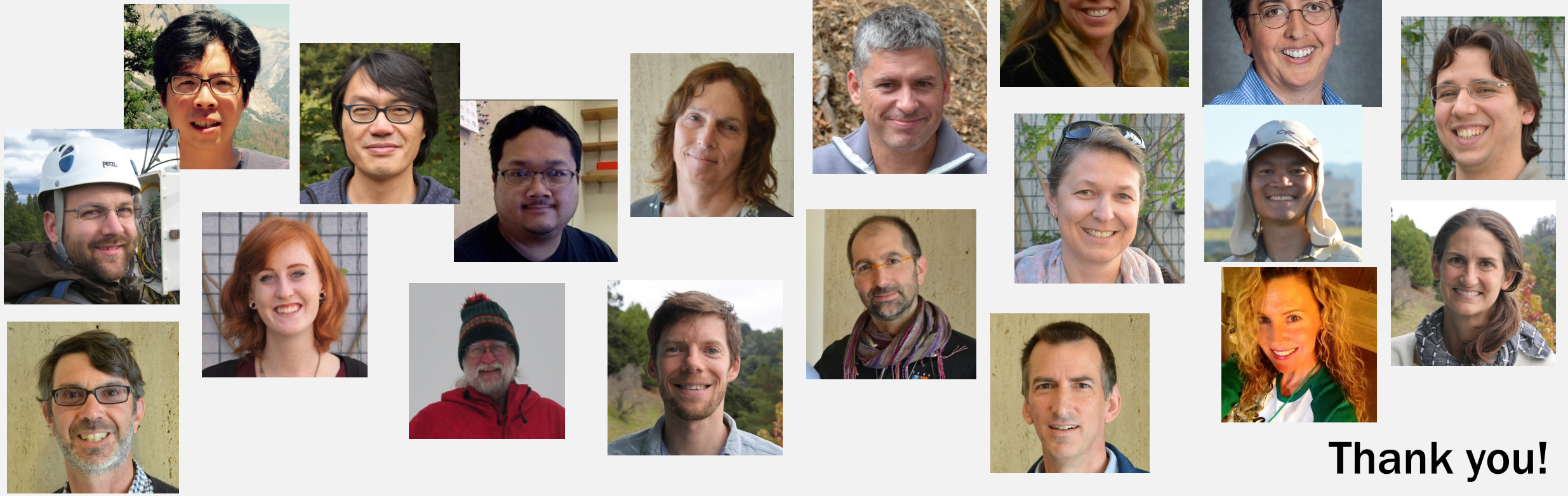
What are your requests?

AMERIFLUX

We welcome all questions / feedback!

ameriflux-support@lbl.gov

https://ameriflux.lbl.gov



Thank you!