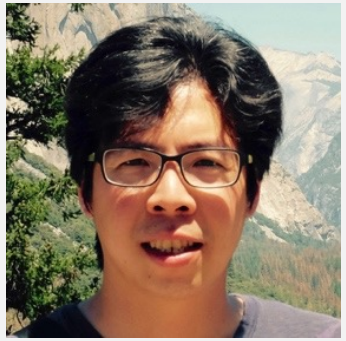
AmeriFlux BASE Data Processing Pipeline



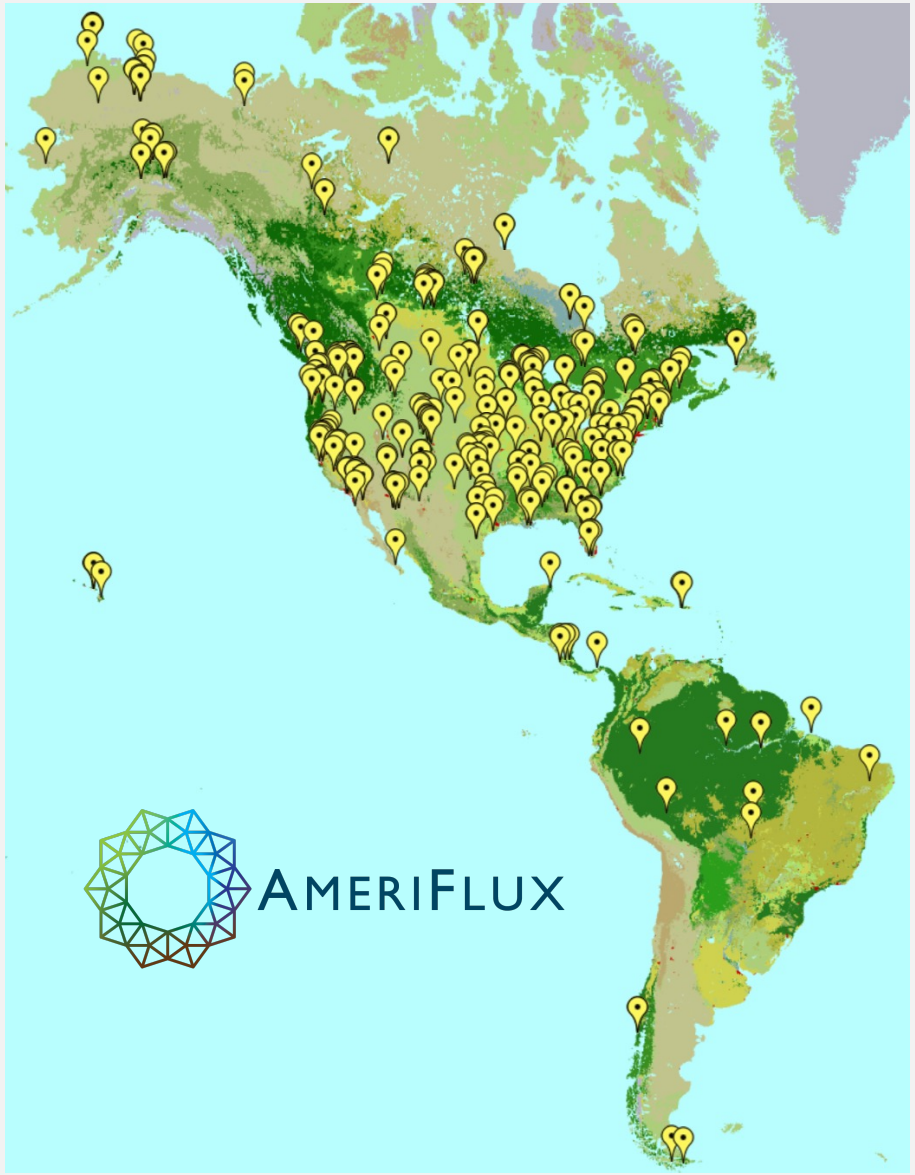
Danielle S. Christianson and AmeriFlux Data Team

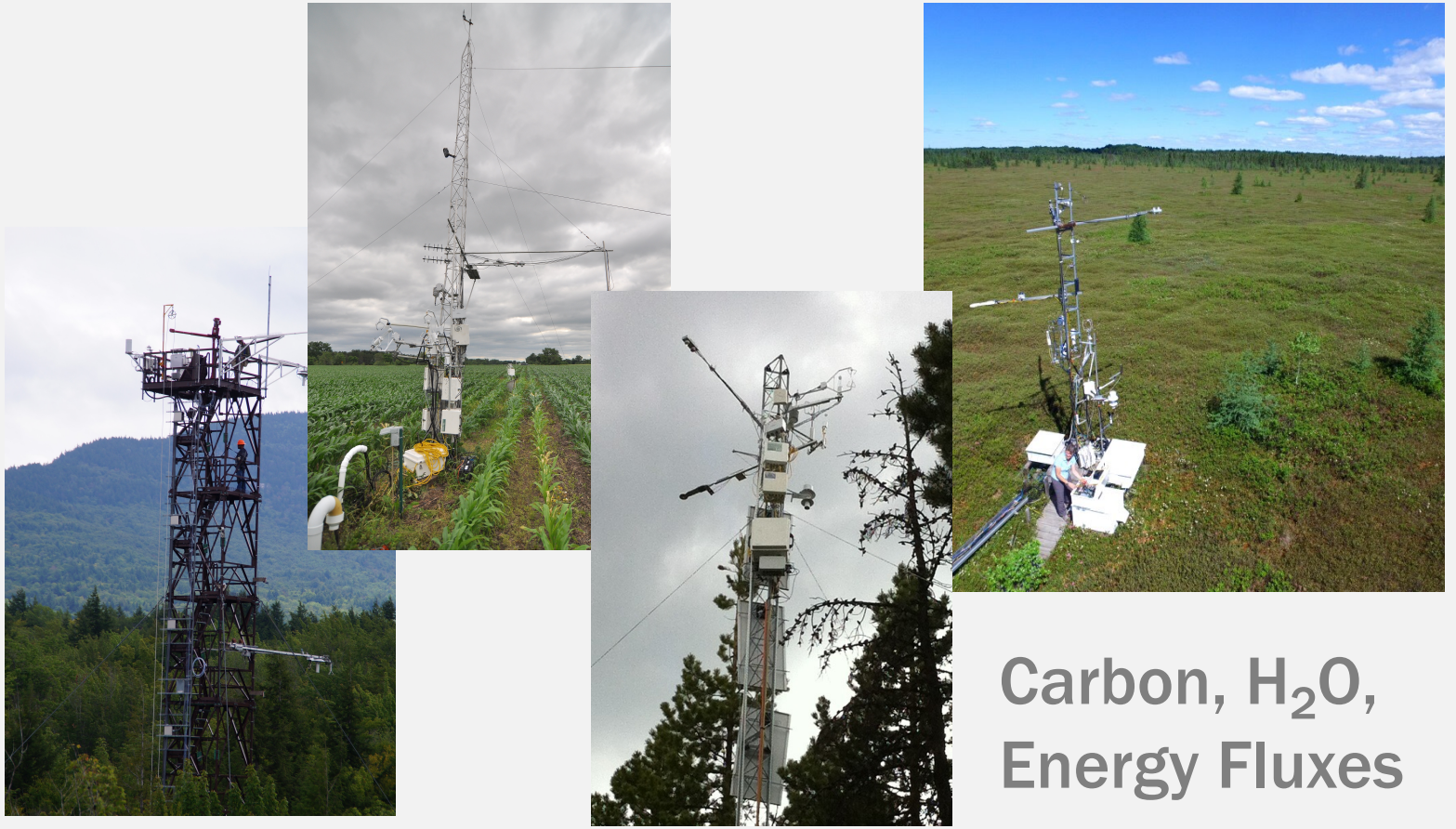
Lawrence Berkeley National Laboratory | Data Science and Technology | Computational Research Division

Cyber-Infrastructure Workshop | 29 April 2019

dschristianson@lbl.gov | ameriflux-support@lbl.gov

AmeriFlux is a voluntary network of independent scientists at 426 sites





Carbon, H_2O, Energy Fluxes

AmeriFlux Data Team facilitates shared, standardized, high quality data products

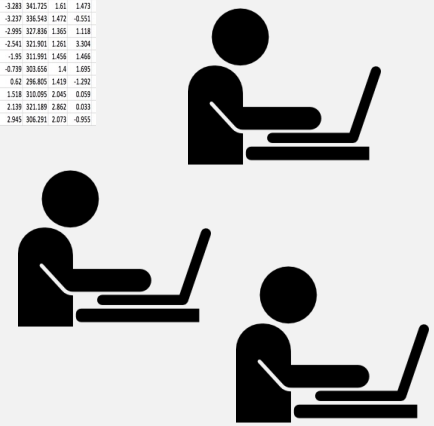
Goal: Synthesize flux-met data from across network to standard product

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	



Standardized input is critical to automation

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	

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	-2.995	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	

Modular processing components

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	

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	

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	
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	

One attempt to autocorrect for minor issues

Iterative process for data provider

Towards automation: 24-hour response → immediate feedback

Towards full automation: 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 Status Definitions, and Upload Format Instructions

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 new file if something is amiss.

- Changed 269876 missing values to -9999 from 234740 instances of -9999.000000 and 35136 instances of NaN.
- File was autocorrected and Autocorrected file uploaded.

▾ WARNING Autocorrected File: US-Ton_HH_200401010000_200501010000.csv Report ID: 27182

Site ID: US-Ton
Site contact: Dennis Baldocchi

Uploader: Format QAQC Pipeline
Upload date: 2018-Oct-23 13:30
Uploaded filename: US-Ton_HH_200401010000_200501010000-2018102313314376.csv

Format QA/QC report summary:
All format QA/QC checks attempted. In most cases, data will be queued for further data processing. See Format QA/QC report email for additional details.

Processing code version: 0.4.27
Processing log file: http://ameriflux-data.lbl.gov/QAQCLogs/QAQC_report_US-Ton_27182_20181023134757.log

Variable names found in the file:
TIMESTAMP_START, TIMESTAMP_END, FC_1_1_1, CO2_1_1_1, CO2_SIGMA_1_1_1, LE_1_1_1, H2O_1_1_1, H2O_SIGMA_1_1_1, H_1_1_1, T_SONIC_1_1_1, T_SONIC_SIGMA_1_1_1, WD_1_1_1, WS_1_1_1, USTAR_1_1_1, W_SIGMA_1_1_1, U_SIGMA_1_1_1, V_SIGMA_1_1_1, TA_1_1_1, VPD_1_1_1, RH_1_1_1, PA, TS_1_1_A, TS_1_2_A, TS_1_3_A, TS_1_4_A, TS_1_5_A, SWC_1_1_A, SWC_1_2_A, SWC_1_3_A, P, ZL_1_1_1, G_1_1_A, NETRAD_1_1_1, SW_IN_1_1_1,

Test	Result(s)	Additional Information
Any Variables suspected gap-fill?	WARNING	These variables are suspected to be gap-filled because they have no missing values: H2O_1_1_1, H2O_SIGMA_1_1_1, RH_1_1_1, PA, SWC_1_1_A, SWC_1_2_A, SWC_1_3_A, P, PPFD_IN_1_1_1, H2O_SIGMA_1_2_1, VPD_1_2_1, RH_1_2_1
Any Variables with ALL Data Missing?	WARNING	These variables have all data missing: **SW_IN_1_1_1, PPFD_OUT_1_1_1, SW_IN_1_1_2, SW_OUT_1_1_1, LW_IN_1_1_1, LW_OUT_1_1_1, PPFD_DIR_1_1_1, PPFD_DIF_1_1_1**. Previously uploaded data with the same time period will be overwritten.

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)

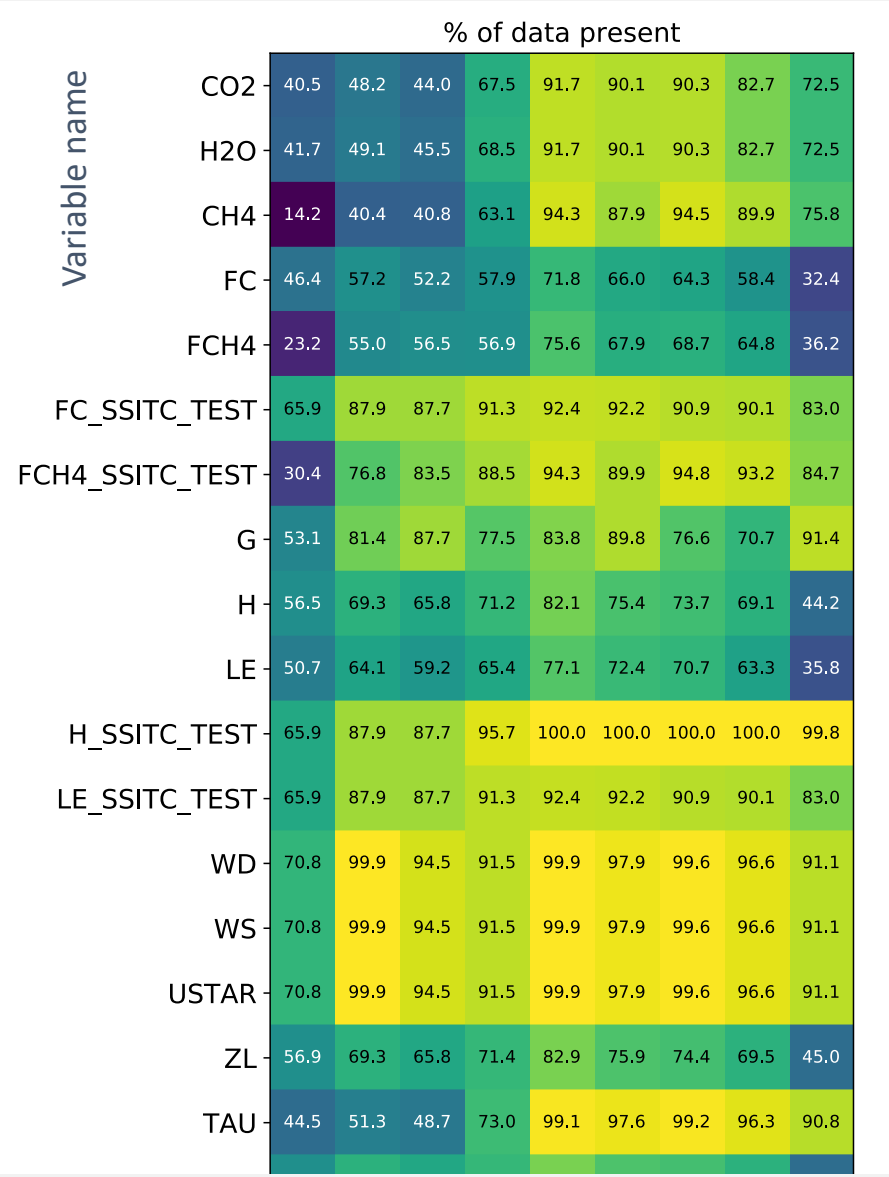
TIMESTAMP_START	TIMESTAMP_END	CO2	FC	USTAR	TA_1_1_1	WD	WS	NEE	S
200401010000	200401010030	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010030	200401010100	-9999	-9999	-9999	-9999	-9999	-9999	-9999	
200401010100	200401010130	371.419	0.561	0.099	-1.172	108.304	1.19	0.563	
200401010130	200401010200	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	

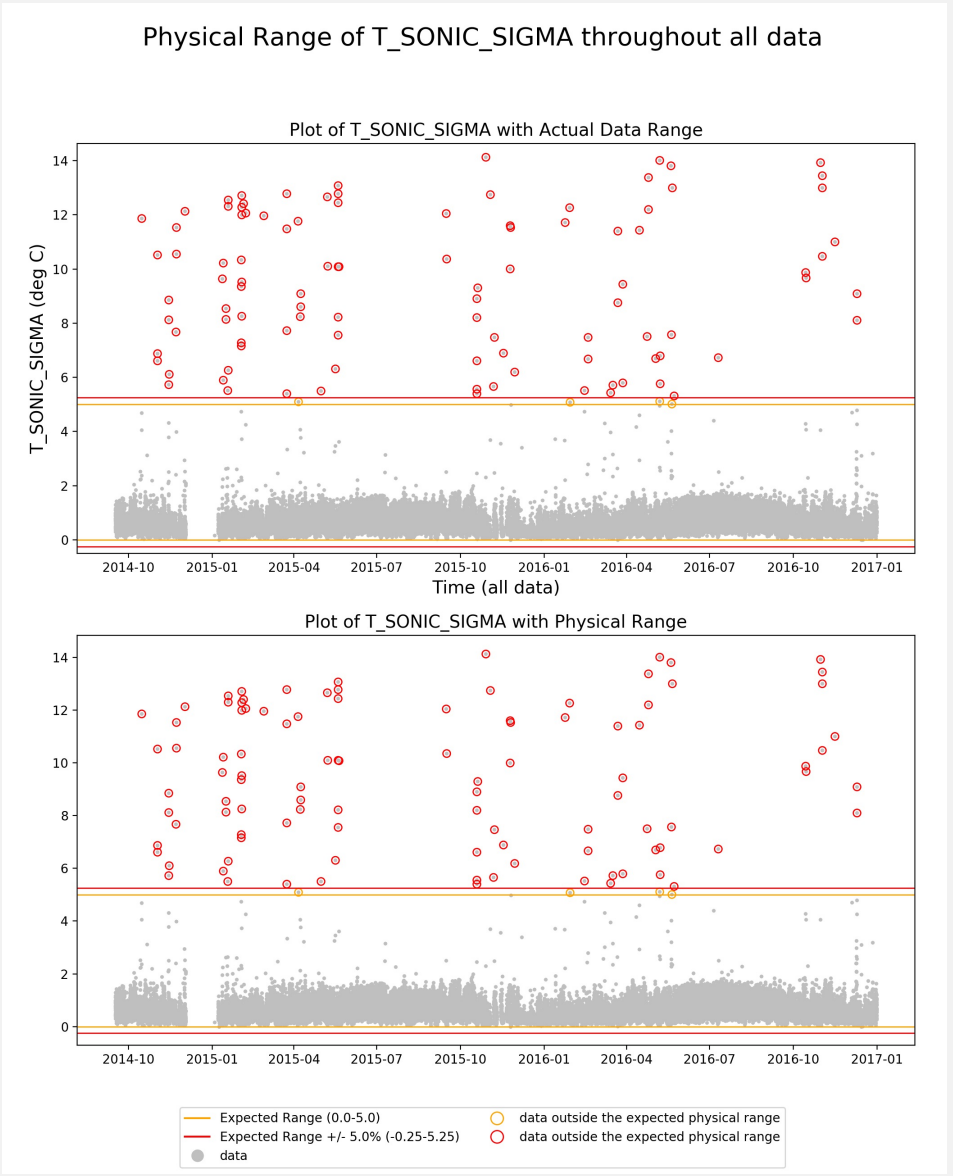
All data years are combined.

Assessment includes:

- **Outliers, units**
- **Seasonal / Daily time shifts**
- **Multivariate comparisons**
- **Technique specific checks (e.g., u* filtering)**

Automated figures





Automated figures with manual synthesis (via Issue Tracker)

Variable name

CO2
H2O
CH4
FC
FCH4
FC_SSITC_TEST
FCH4_SSITC_TEST
G
H
LE
H_SSITC_TEST
LE_SSITC_TEST
WD
WS
USTAR
ZL
TAU

QAQC-1145

Return to queue

Data Results | US-ADR HH 20110101 - 20170523 | Using uploads through Dec 06, 2017

Edit | Comment | Assign | More | Undo | Admin | Export

Details

Type:	Data QAQC Results	Status:	PUBLISHABLE (View Workflow)
Priority:	Medium	Resolution:	Unresolved
Affects Version/s:	None	Fix Version/s:	None
Component/s:	None		
Labels:	Results_Sent		
Process ID(s):	11086		
Site ID:	US-ADR		
Temporal Resolution:	HH		
Report Link:	http://ameriflux.lbl.gov/qaqc-report/?site_id=US-ADR&report_id=11086		
FTP Link:	ftp://ftp.fluxdata.org/.ameriflux_downloads/data/.US-ADR_9403460/11086/output		
sandbox:	*[DATA QA/QC]*		

Description

QAQC completed with the following results critical(0), error(12), warning(6), ok(63)

Attachments

Drop files to attach, or browse.

Issue Links

updates	QAQC-1091 Data Results | US-ADR HH 20110101 - 20170523…	REPLACE WIT…
has/had issue	QAQC-1107 Constant (gap-filled) PA 2011-2015	FIXED
	QAQC-1108 Invalid missing values in SWC (2014, 2016, 2017)	FIXED
has Format QA/QC	QAQC-1144 Format Results - Review requested | US-ADR dat…	ATTEMPT DAT…

SLAs

-15:03 Time to resolution within 24h

6:28 Time to first response within 8h

People

Assignee:	Unassigned
	Assign to me
Reporter:	Michael T. Moreo
Request participants:	andraski@usgs.gov
Organizations:	US-ADR
Votes:	0 Vote for this issue
Watchers:	0 Start watching this issue

Service Desk request

Request type:	Data QAQC
Customer status:	Publishable
Channel:	JIRA

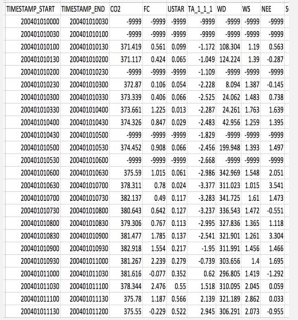
View customer request

Dates

Created:	07/Dec/17 10:27 AM
Updated:	07/Dec/17 11:58 AM

BASE data product made available online

BASE-In
(FP-In)



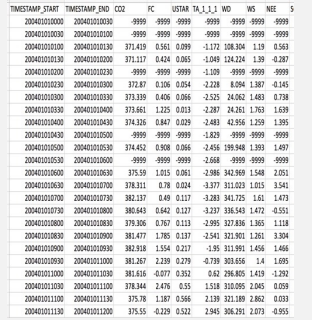
Format QA/QC

Data QA/QC

BASE Data Product available w/ DOI

BASE Publish

BASE
(FP Standard)



Online tools include:

- Data Availability by site, variables
- Data Processing Status for each site
- Coming soon: search sites by variables in specific years

No off-the-shelf-solution → multicomponent software stack

Metadata management, data processing tracking

Python **Data processing**

JIRA Service Desk **Communications, some data processing tracking**

Javascript, PHP front end **Static communication, data upload / download**

MS WCF & WebAPI Webservices **Communication between system components**

Takeaways

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

Does data pass quality checks?

Data QA/QC

BASE Data Product available w/ DOI

BASE Publish

Publish ~ monthly

Time to first response:
Format QA/QC ~ 1 day
Data QA/QC ~ 1-2 weeks

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	

\+

BIF (BADM data product)

Standards → Automation → Scalability

Automate incrementally

Operations & Maintenance take a lot of resources

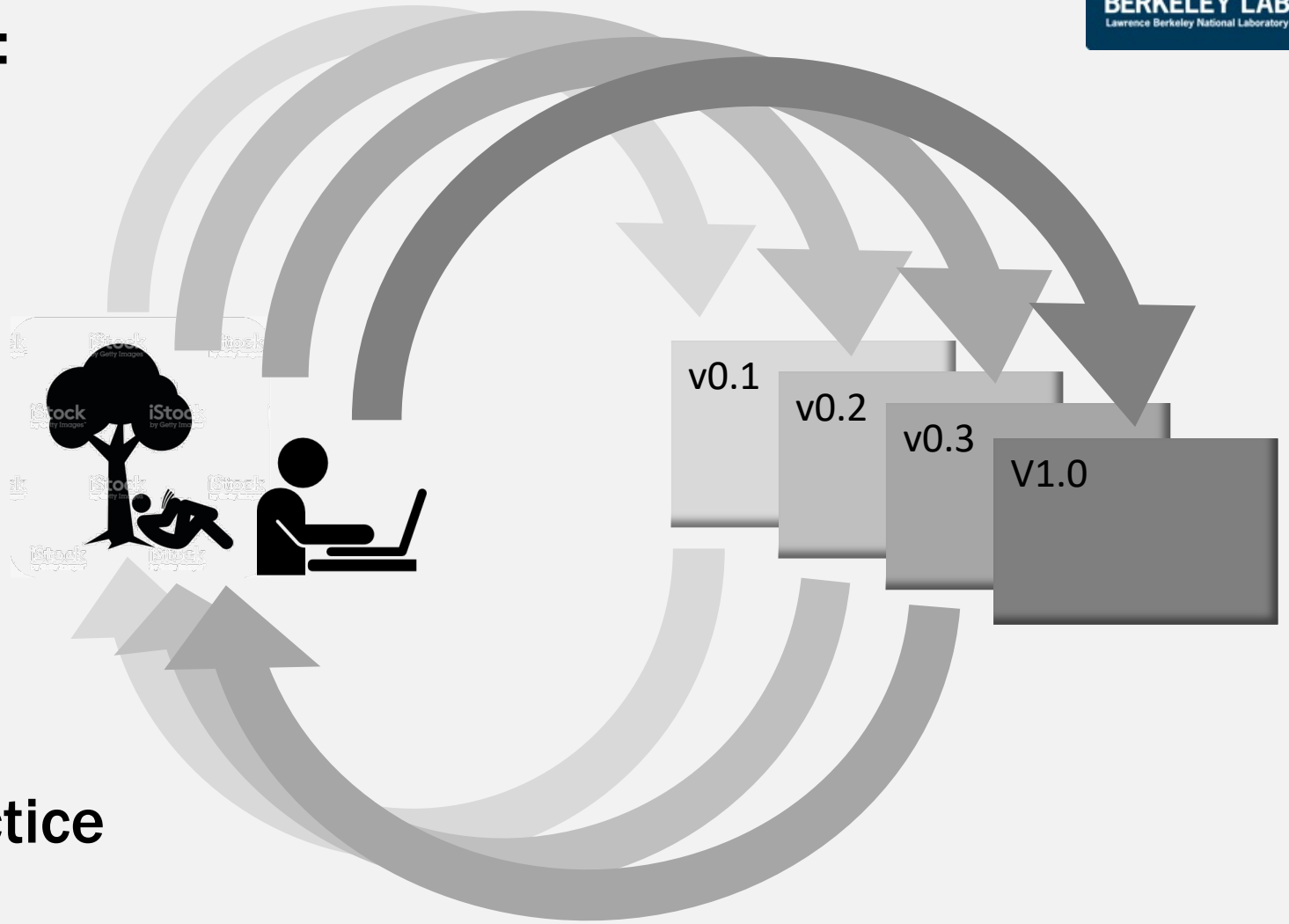
User-centered approach leads to usable tools

U.S. DEPARTMENT OF ENERGY | Office of Science

BERKELEY LAB
Lawrence Berkeley National Laboratory

Earth science data challenges:

- Data DIVERSITY
- Standards
- Metadata / Data reporting
- Provenance / Archiving
- Attribution



We need more / better tools

AND change in science practice

We use scientist-centered design approach + agile development