openeddy

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CzechGlobe
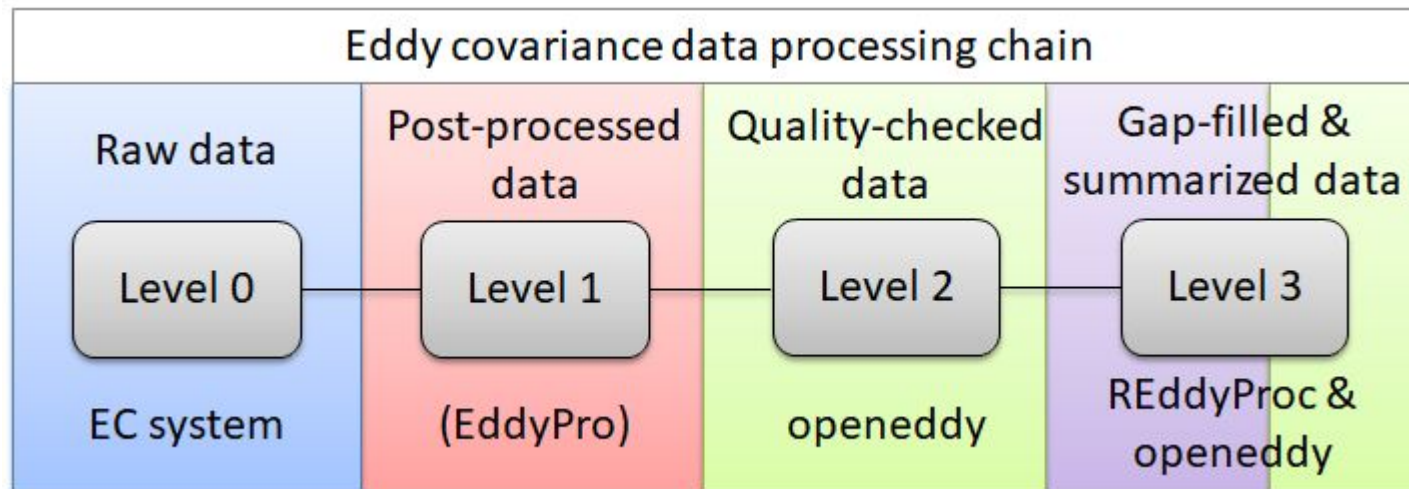
Global Change Research Institute CAS

Why openeddy?

- Data post-processing can take substantial amount of time
  - hindering FLUXNET submissions, producing papers
- Need to assess and quality check all four fluxes (Tau, H, LE, FCO_2)
  - often subjective, not scalable
- Difficult to assess data effectively across different timescales
 - plotting resolution/aggregation

Principles

- Complete processing chain currently tuned to EddyPro and REddyProc
  - loading EddyPro output and then working in R environment
  - incorporation of additional routines for computing wind roses, footprints, storage, spectral analysis, …
  - stop bothering about the details with the processing implementation

| Eddy covariance data processing chain			
Raw data	Post-processed data	Quality-checked data	Gap-filled & summarized data
Level 0	Level 1	Level 2	Level 3
EC system	(EddyPro)	openeddy	REddyProc & openeddy

Quality control

- Separating to multiple substeps checking different aspects of data
  - typically order-dependent steps
  - theoretically endless possible combinations of tests/filters
  - documentation is really important
- Visual check of flagging results - check the effect on the data
  - "flagging effectivity": data exclusion % vs. uncertainty increase or degree of change in aggregated fluxes

See data in perspective – plot_eddy()
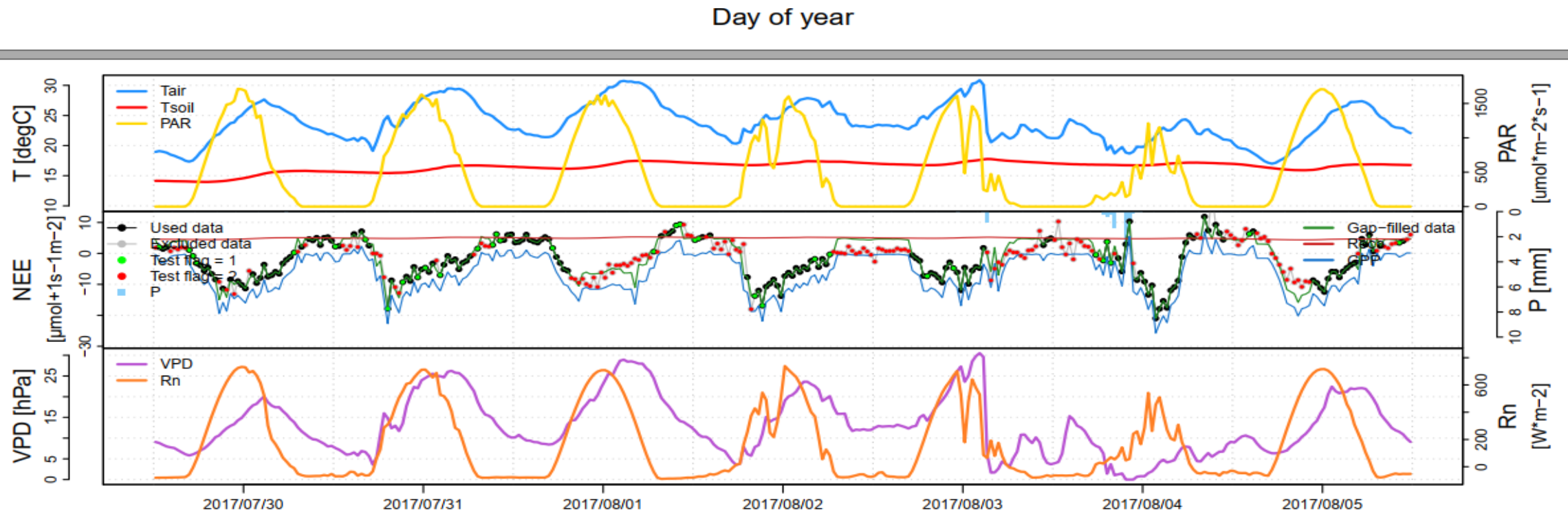
QC summary of all fluxes

NEE − Cumulative effect of QC flags
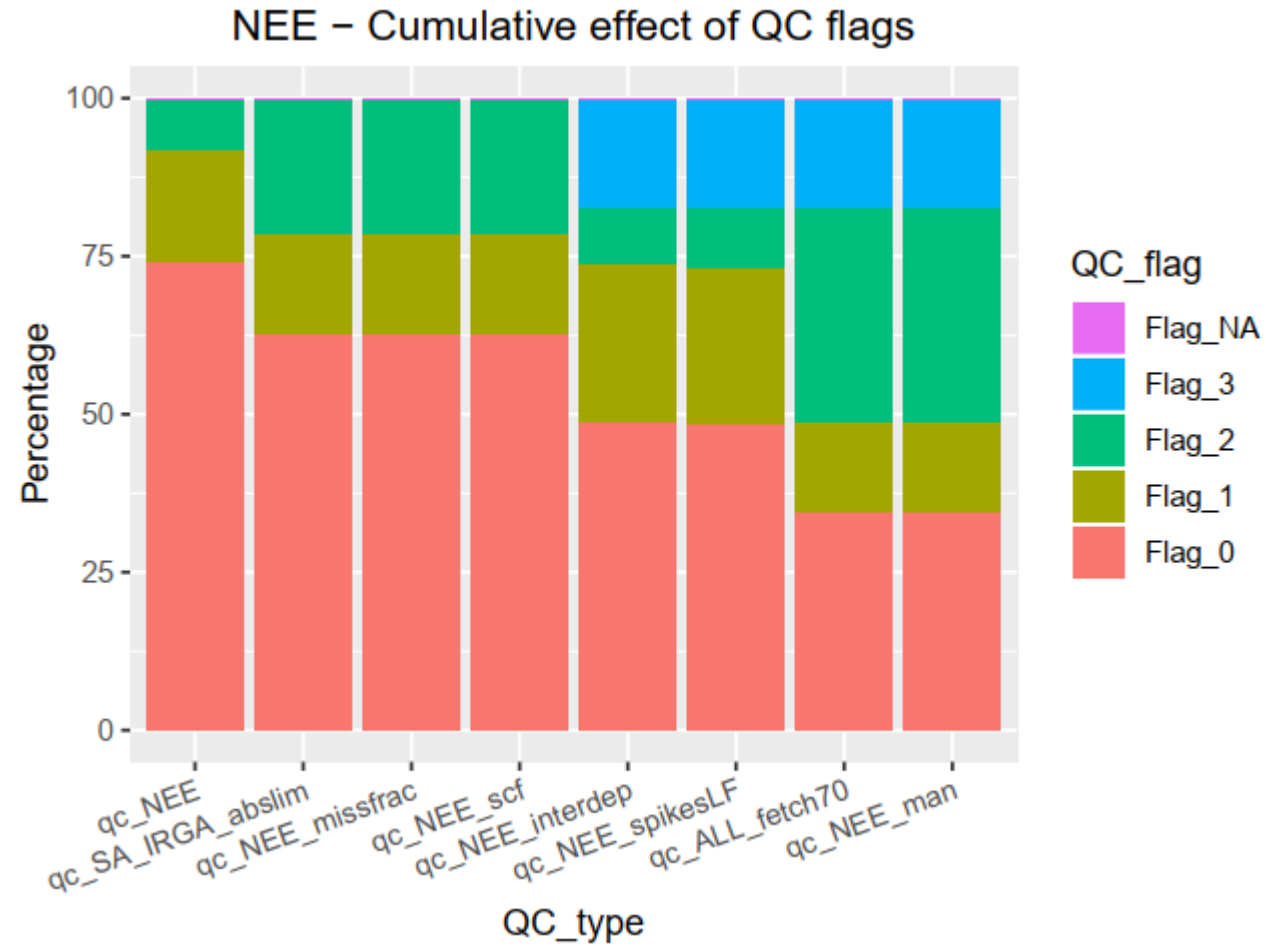
Naming strategy in openeddy

qc prefixes
- specify which flux is affected by that QC output
- qc_Tau, qc_H, qc_LE, qc_NEE: only applicable for the respective flux
- qc_SA: applicable to fluxes relying only on sonic (Tau, H)
- qc_SA_IRGA: applicable to fluxes relying both on sonic and IRGA (LE, NEE)
- qc_ALL: applicable to all fluxes

qc suffixes
- specify which QC check was applied to get this QC output
- SS_ITC test is without suffix
- **1) composite:** abslim, spikesHF, missfrac, scf, wresid, interdep, manual
- **2) forGF:** spikesLF, fetch_filter

Dataset summary

- Summary of key variables on different timescales (daily, weekly, monthly, yearly)
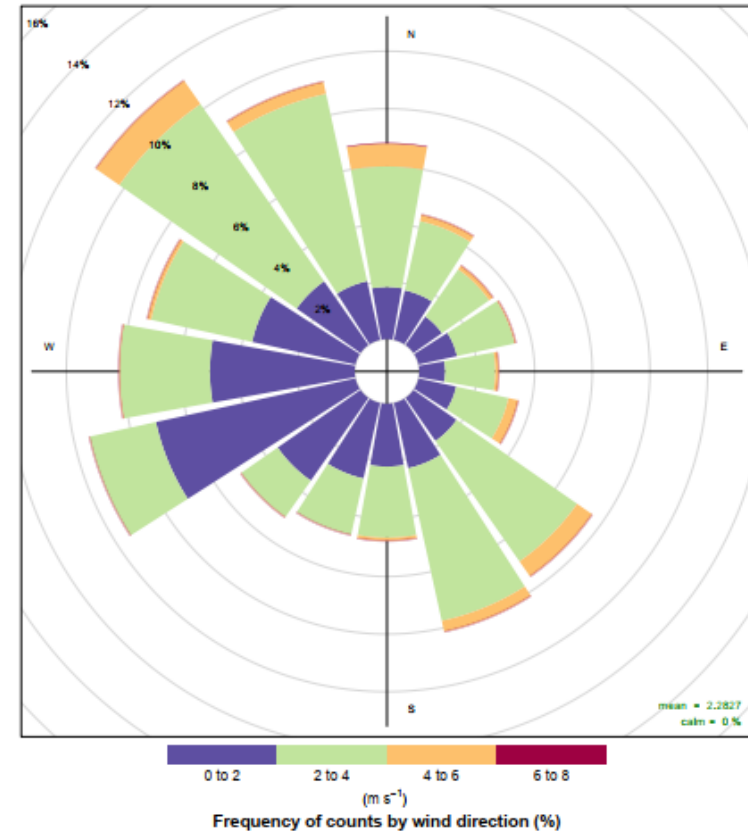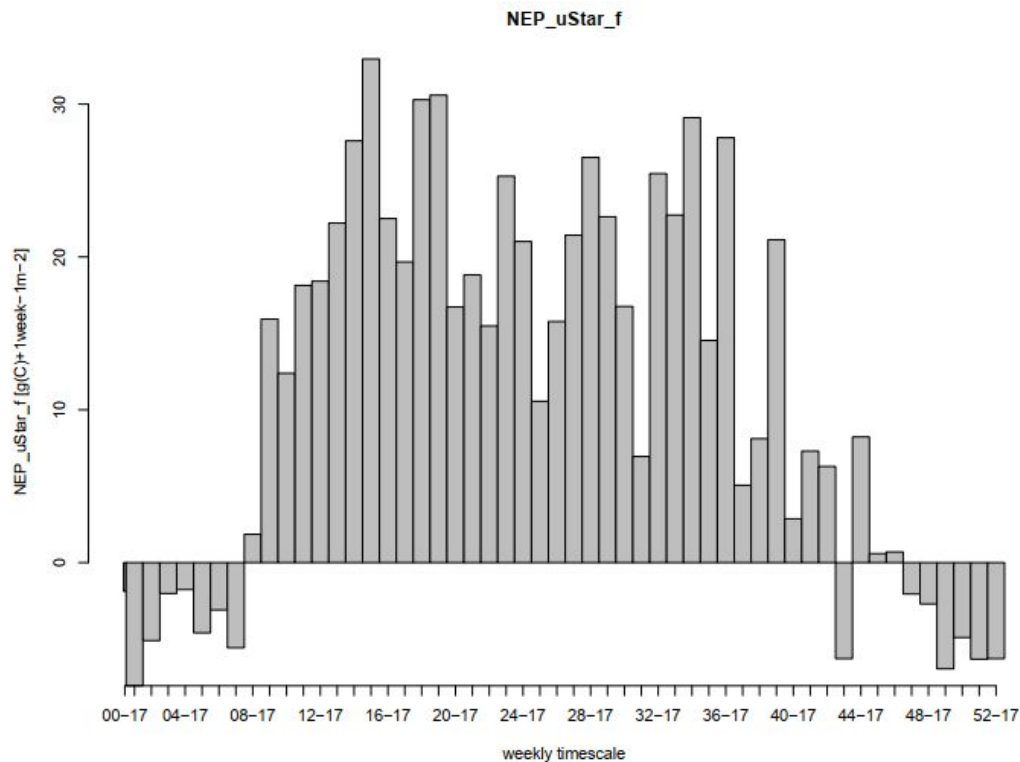
Lookout

- Possibility to consider additional data quality issues over time
- Connect other free software to the processing chain
- Looking forward to contributions from the community