A WMO standard for eddy covariance measurements

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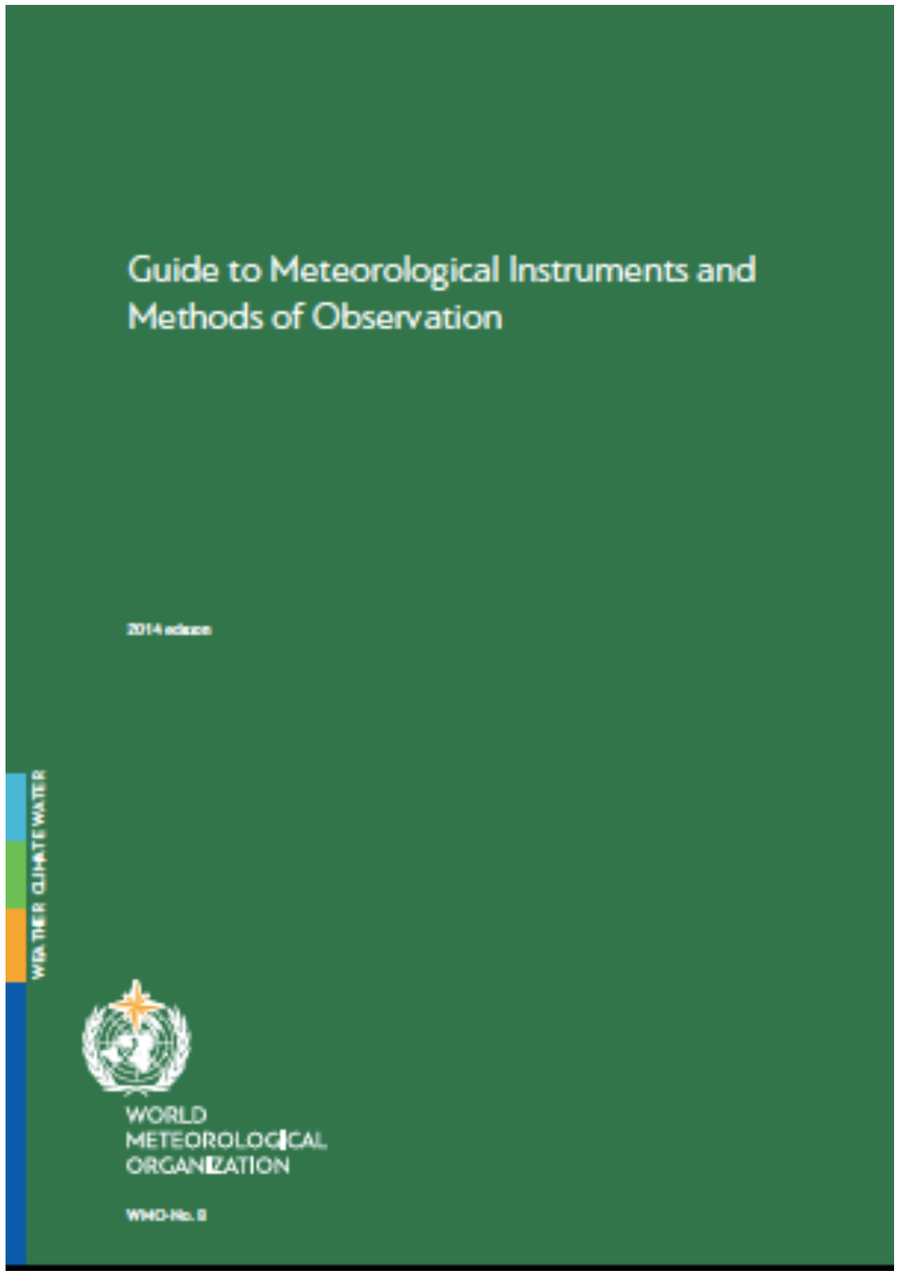
Why a standard?

- The application of the technique at relatively large temporal and spatial scales and operational systems for longer and longer periods, requires standardization. Particularly in light of the current development activities that focus on integrating carbon and ecological observations trans-nationally/inter-continentally make this a salient, scientifically and politically urgent issue, e.g., ICOS, NEON, AsiaFlux, CoopEUS (www.coopEUS.eu).

- It is critically important that measurements are performed in a standardized manner for their eventual use in GMES services, including use in operational data assimilation systems. We will collaborate with the WMO Technical Commission on meteorology and other international bodies to develop a WMO standard for EC measurements. This will require the production of a standard protocol, including data acquisition, treatment, corrections, error and uncertainty analysis. This will be submitted to WMO Technical Commissions after which a standard can be developed.

- To achieve this goal, ICOS and NEON have joined forces to propose to CIMO-ET-NIST the development of an EC standard to be included in the CIMO Guide.

Why WMO-CIMO?

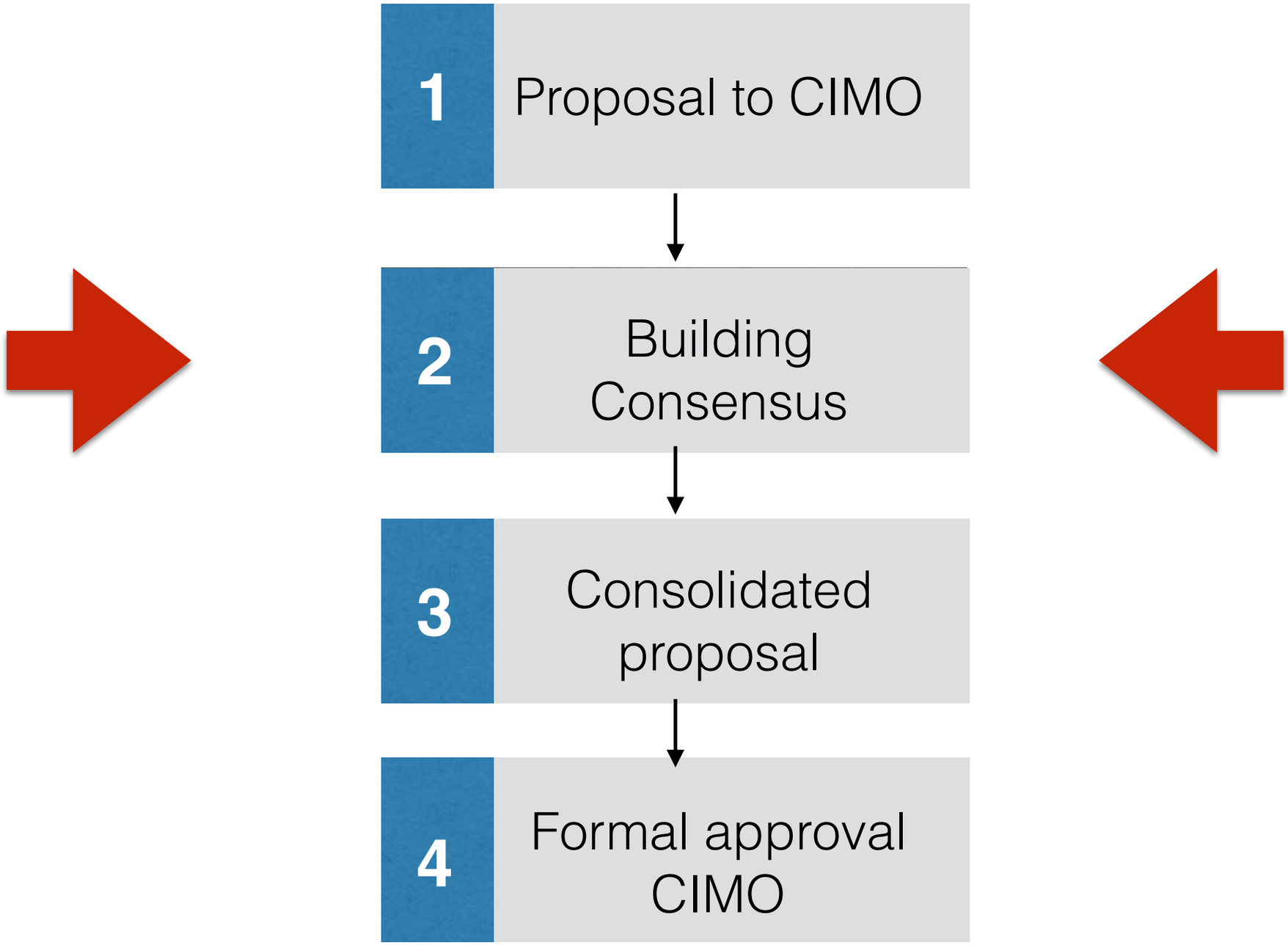


The WMO The mission of the Commission for Instruments and Methods of Observation (CIMO) is to promote and facilitate international standardisation and compatibility of instruments and methods of observation used by Members, in particular within the WMO Global Observing System, to improve quality of products and services of Members and meet requirements

WMO is a ISO recognised standard setting institution

https://library.wmo.int/opac/doc_num.php?explnum_id=3121

Process to a standard



Proposal to CIMO

WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION

EXPERT TEAM ON NEW IN-SITU TECHNOLOGIES (ET-NIST)
First Session

Geneva, Switzerland, 10-13 September 2013

CIMO/ET-NIST-1/Doc. 4
(08.VIII.2013)

ITEM: 4

Original: ENGLISH ONLY

STANDARD FOR EDDY COVARIANCE OBSERVATION

(Submitted by the Han Dolman, on behalf of GCOS-TOPC, ICOS, NEON)

Summary and purpose of document

The purpose of this document is to request ET-NIST to evaluate the request lead by ICOS (Integrated Carbon Observing System, EU) and NEON (National Ecological Observatory Network, US) to develop a globally accepted standard for eddy covariance measurements

This document outlines the request, its origins, the maturity of the technique, the national (e.g., OzFlux) and international organisations (e.g., AsiaFlux, AmeriFlux,) and the proposed route for developing the standard.

This document also list the steps agreed by consensus at the first session of CIMO-ET-NIST

ACTION PROPOSED

ET-NIST is requested to:

1. Review this document and decide if a path to develop a standard can be advanced.

2. Recommend to CIMO MG that this request is placed on the agenda in the next meeting to enlist engagement and support from the wider CIMO community (WMO-GAW).

CIMO-ET-NIST Conclusions

- Development of an EC standard has high utility and would be useful, and CIMO is the appropriate entity to manage the standard once it has been drafted by a group of experts drawn from the global EC community;
- The representatives of major continental networks (ones with governance structures and mandates for sustained observing capability such as ICOS, NEON, AsiaFlux, OzFlux, AmeriFlux) should form a working group that reflects the needed level of international organisation and consensus to develop an EC Standard, i.e., its instrumentation type(s) (principles of operation), algorithmic processes, and field deployment/site design;
- This working group is to submit a draft outline for a EC Standard by the end of 2013 for consideration by CIMO ET-NIST, in collaboration with relevant experts from CAS, which will then make a recommendation to CIMO MG on the appropriateness of WMO involvement in the proposed standard, and whether to publish the standard in the CIMO Guide or using an alternative mechanism;

CIMO-ET-NIST Conclusions

- Assuming a positive response from CIMO and CAS to ET-NIST's recommendation, the working group will draft the document and vet its content with the broader user community (formal community review process), track and incorporate comments, and submit a final version for CIMO/CAS review;
- Formal CIMO/CAS review of the final version should then follow, with the aim to have this standard published as soon as practicable after that.

Building consensus

- 16 December 2015 AGU. Meeting FLUXNET Continental groups
- July 2016 Draft standard prepared
- Comments by NEON
- 8 June 2017 FLUXNET Workshop (http://ucanr.edu/sites/PSU/files/263049.pdf; comments on Excel sheet)
- Consolidated draft

Consolidated Draft

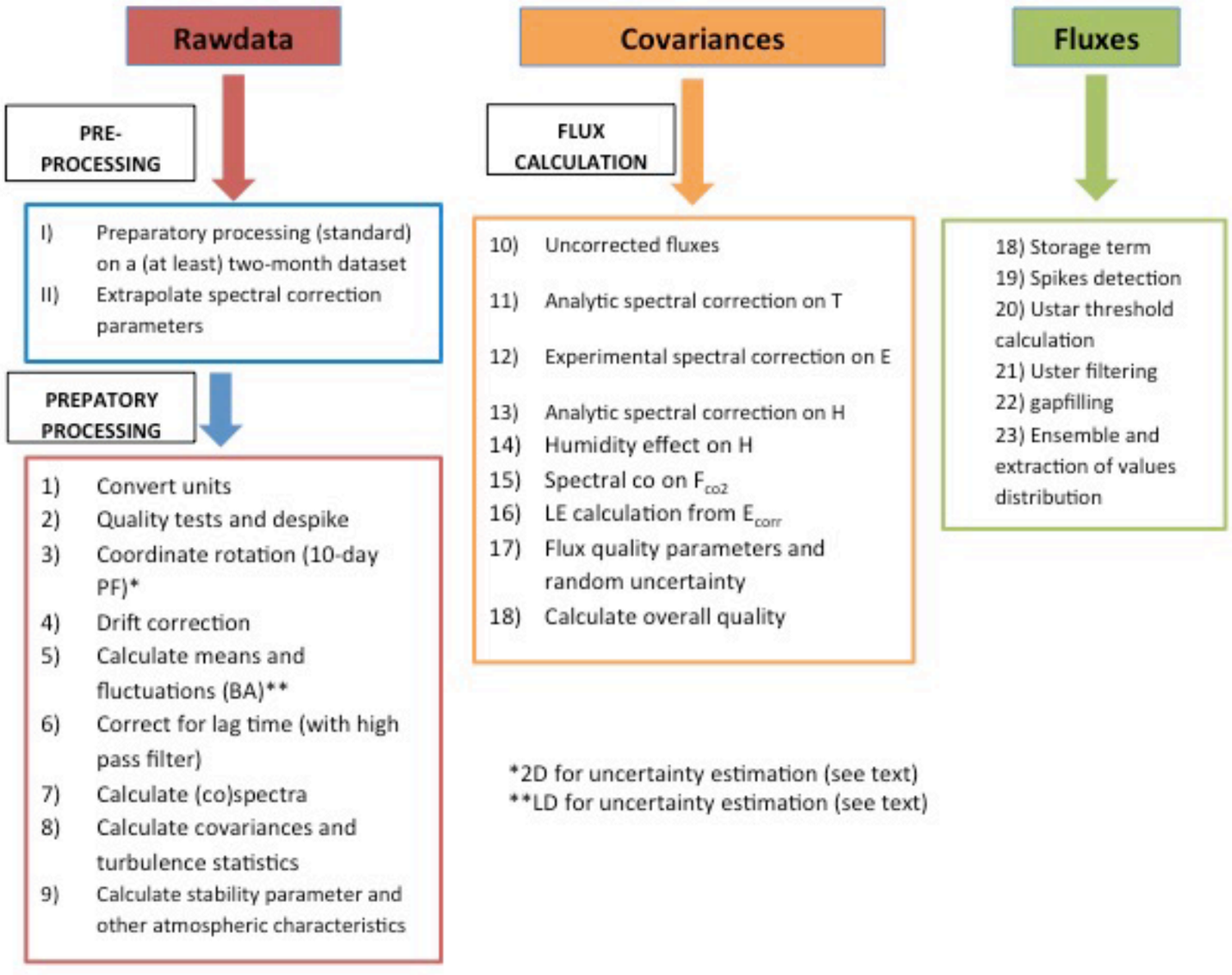
Second draft for FLUXNET workshop June 2017.

This is a draft of a possible chapter for the handbook of the WMO commission on meteorological observations. It is based on ICOS, NEON documentation and literature.

Please do not further distribute or quote. There is long public review foreseen after this first draft is consolidated at after the 2017 FLUXNET workshop.

This version, 21 May 2017 is edited by
Han Dolman and commented on by Hank Loescher and David Durden

Conceptual structure



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Next steps

- Agree this is a useful thing to do
- Comment on draft and circulate within community (2 months from now?)
- Produce consolidated draft (autumn 2017)
- Submit to CIMO-NIST (autumn 2017)