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WP1 – Elucidating user needs



WP1 overview

- Determine requirements by FCDR users
- Interviewed 16 FCDR users
- Synthesised lessons from interviews into a report
- Extracted 39 requirements for FIDUCEO project
- Updated after each User Workshop
 - final version D1_2 delivered last month

Survey highlights

- Survey in form of structured interviews to get most information out
 - Note that the NPL/Assimila TRUTHS team adopting same approach
- Invited 47 users of FCDR data for interview. Completed 16 interviews: significant share of worldwide FCDR users
- Interviews covered 14 CDRs from 20 instruments/FCDRs

Survey structure

What climate data record you produce / develop

This page asks about the nature of the climate data record (CDR) you produce / develop. If you produce more than one different CDR, the interviewer will start a new survey for the second and any subsequent CDRs. Treat a set of related variables derived jointly from a common set of L1/FCDR inputs for the same locations as a single CDR.

5. What is (are) the geophysical variable(s) in your CDR? We will mainly explore requirements in relation to the primary variable in your products.

Primary

Secondary

Tertiary

The following questions should be answered in relation to the primary geophysical variable. Recall that by CDR users, we mean specifically people and institutes who use the product for studying climate, such as addressed by the [GCOS Systematic Observation Requirements for Satellite-based Products for Climate](#).

6. Please state or estimate user requirements for your CDR (primary variable), if relevant (otherwise, indicate later why not).

Uncertainty (random effects)

Uncertainty (systematic effects)

Long-term stability

Spatial resolution

Temporal resolution

Timeliness (climate applications)

Length of record

7. On what statement of requirements are the above based?

8. Please elaborate on any of the above, and add other user requirements not addressed above

- Basic information about interviewee
- CDR questions
- CDR uncertainty questions
- Generic FCDR questions: type of data, list of sensors
- Specific sensor questions: obtaining/reading data, availability of information on uncertainty, stability, harmonisation, and pre-launch data
- Miscellaneous and final questions

User requirements

D1.1 User Requirements Report

Executive Summary

An assessment of user requirements for Fundamental Climate Data Records (FCDRs) was undertaken using two sources: a set of 16 interviews with current FCDR users, and a review of prior literature. From this assessment, requirements for Fidelity and Uncertainty for Climate and Earth Observation (FIDUCEO) were defined as follows. The remainder of the document contains a detailed specification of how these requirements were derived.

Summary of FIDUCEO requirements:

(The complete list of all requirements is in Section 11).

The tables below sort the requirements under

- Content,
- Documentation
- Access
- Process and
- Recommendations

Note that due to the requirements generated, some requirements are listed under both content and documentation.

Content	
FIDUCEO-1	Fundamental Climate data Records (FCDRs) should contain information to assist producers of Climate Data Records (CDRs) and other derived geophysical products to estimate uncertainty and provide traceability information required by their users.
FIDUCEO-4	FCDR uncertainty information must include a description of error correlations sufficient for CDR producers to account for error correlations propagated from the FCDR in their CDR.
FIDUCEO-7	To support provision of comparable uncertainty information in derived products, FCDRs should either (i) include uncertainty estimates separated into components having distinct error correlation structures, or (ii) be represented as an FCDR ensemble, where this is the more feasible and valid approach.
FIDUCEO-8	FCDRs and documentation should support CDR creators to assess the expected performance of derived CDRs against quantitative requirements, such as those of Global Climate Observing System (GCOS).
FIDUCEO-9	FCDR products should enable CDR producers to generate a variety of forms of uncertainty information required by CDR users.
FIDUCEO-10	FCDRs should include pixel-level uncertainties in cases where there is variation in the uncertainty at FCDR pixel level, since some CDR producers require to produce pixel-level uncertainty information.
FIDUCEO-14	FCDR products should include all necessary and established systematic corrections (such as due to calibration), rather than require CDR producers to apply additional corrections.
FIDUCEO-15	FCDR products should not include any duplications of data.
FIDUCEO-16	FCDR products should flag all corrupted data, including missing scanlines.

- Extracted **39** requirements from responses
- Related to
 - content
 - documentation
 - access
 - process
 - recommendations

Appendices to Report

- A : implications for specific sensors
- B: requirements not directed to FIDUCEO area
- C : proposed definitions for FCDR and CDR (major outcome of 1st workshop)
- **E : forward-looking lessons / ideas from 2nd workshop**
 - satellite intercalibration
 - UNFCCC stocktake
 - where next for Fidueo analyses

Satellite intercalibration

- Need to establish link from required CDR stability to inform FCDR requirements
- Matches may be a product
- Need more questioning of calibration model
- Pre-flight uncertainty tree analysis (Dave Smith SLSTR)
- Uncertainty information facilitates harmonisation
- R&D and practical question
- Need to establish requirement
- Recommendation to space agencies – e.g. HPCM missions
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- Insight / recommendation to space agencies

Stocktake

- Common uncertainty framework can support users
- Relevance of datasets needs to be championed
- Data assimilation centres should rethink observational uncertainty
- Ensemble CDRs may support stocktake users better
- Benefit of using FIDUCEO approach
- In-country opportunity for R&D community to engage government
- Recommended for R&D (some activity in C3S projects)
- Ongoing and recommended R&D (build on Ens ST CDR)

Where next FIDUCEO analyses?

- Biophysical records
- Categorical records (e.g., fire)
- Easy-FCDRs for current missions, not only historic
- Guidelines on validating uncertainties
- Willing to apply FIDUCEO-like analyses
- More examples, guidelines, an expert systems to make analyses easier and cheaper in future
- R&D
- R&D (some ongoing in CCI)
- Recommendation to space agencies
- Future project (some ongoing in CCI)
- MetEOC (ongoing), ECOSTRESS (US, visit planned by LST CCI), CM-SAF (to aid documentation)
- R&D and practical future project (meanwhile, legacy website)

Forums for ongoing user engagement

- CEOS-GSCIS (happened this week)
- TRUTHS mission
- WCRP workshop on satellite observations (possible 2021)
- Go beyond Europe and US
 - CEOS WG Cal/Val can help, and CEOS in general
- CCI programme and CMUG
- SAF network (“third workshop” discussed with CMSAF for future)
- obs4MIPS – guidance notes for modellers (often via CCI)