



EU Sponsored Quality Assurance / Validation Projects

(with focus on atmospheric CDRs)

Jean-Christopher Lambert

Royal Belgian Institute for Space Aeronomy (BIRA-IASB)

Session on Atmospheric Remote Sensing

WGCV Plenary #40

Canberra, March 14-18, 2016

Working Group on Calibration and Validation

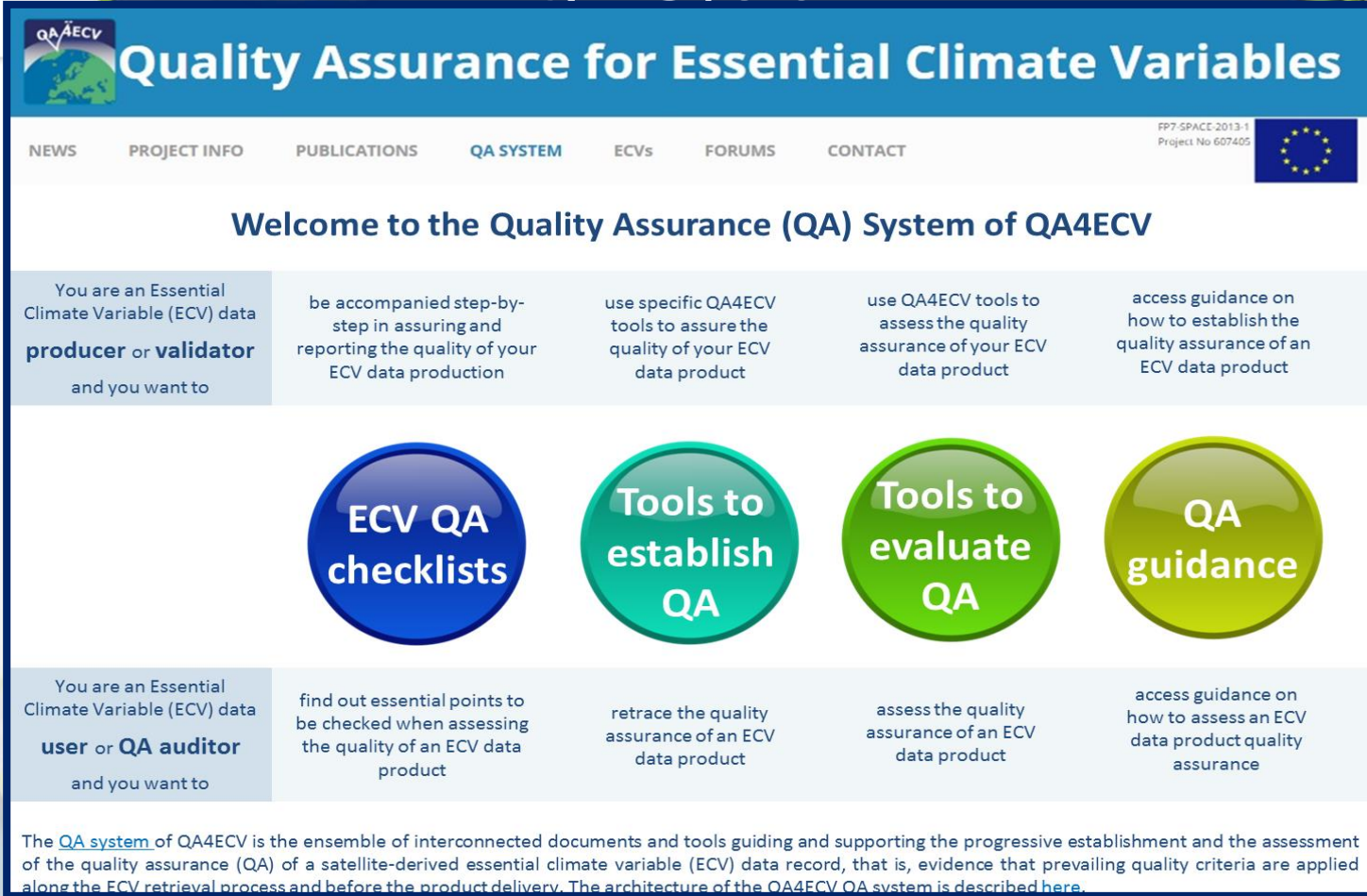




FP7 and H2020 projects with explicit QA related activities of CEOS WGCV relevance

- CORE-CLIMAX (<http://coreclimax.eu>) – Coordinator B. Su, ITC
Coordinating Earth Observation Data Validation for RE-analysis for Climate Services
- QA4ECV (<http://qa4ecv.eu>) – Coordinator F. Boersma, KNMI
Quality Assurance for Climate Essential Variables
- GAIA-CLIM (<http://gaia-clim.eu>) – Coordinator P. Thorne, Maynooth U.
Gap Analysis for Integrated Atmospheric ECV CLimate Monitoring
- Fiduceo (<http://fiduceo.eu>) – Coordinator C. Merchant, U. Reading
Fidelity and Uncertainty in Climate data records from Earth Observation

This is not an exhaustive list !



QA4ECV Quality Assurance for Essential Climate Variables

NEWS PROJECT INFO PUBLICATIONS QA SYSTEM ECVs FORUMS CONTACT

FP7-SPACE-2013-1
Project No 607405

Welcome to the Quality Assurance (QA) System of QA4ECV

<p>You are an Essential Climate Variable (ECV) data producer or validator and you want to</p>	<p>be accompanied step-by-step in assuring and reporting the quality of your ECV data production</p>	<p>use specific QA4ECV tools to assure the quality of your ECV data product</p>	<p>use QA4ECV tools to assess the quality assurance of your ECV data product</p>	<p>access guidance on how to establish the quality assurance of an ECV data product</p>
<div> <div>ECV QA checklists</div> <div>Tools to establish QA</div> <div>Tools to evaluate QA</div> <div>QA guidance</div> </div>				
<p>You are an Essential Climate Variable (ECV) data user or QA auditor and you want to</p>	<p>find out essential points to be checked when assessing the quality of an ECV data product</p>	<p>retrace the quality assurance of an ECV data product</p>	<p>assess the quality assurance of an ECV data product</p>	<p>access guidance on how to assess an ECV data product quality assurance</p>

The [QA system](#) of QA4ECV is the ensemble of interconnected documents and tools guiding and supporting the progressive establishment and the assessment of the quality assurance (QA) of a satellite-derived essential climate variable (ECV) data record, that is, evidence that prevailing quality criteria are applied along the ECV retrieval process and before the product delivery. The architecture of the QA4ECV QA system is described [here](#).

IN DEVELOPMENT !

Quality Assurance for Essential Climate Variables

[NEWS](#)
[PROJECT INFO](#)
[PUBLICATIONS](#)
[QA SYSTEM](#)
[ECVs](#)
[FORUMS](#)
[CONTACT](#)

FP7 SPACC 2013-1
Project No 607405

QA System architecture

- QA system architecture
- ECV QA checklist
- Documentary Framework
- Tools to establish QA
- Tools to evaluate QA
- Reference data
- Satellite-derived ECV CDRs
- Establishment of quality indicators

Data and derived products shall have associated with them a fully traceable indicator of their quality to enable users to assess their suitability for particular applications, i.e., their "fitness for purpose" (QA4EO)

```

graph TD
    subgraph Elements_of_QA_framework [Elements of a QA framework]
        direction LR
        T[Tools to establish QA] <--> D[Documentary Framework]
        D <--> E[Evaluation of Product QA]
    end

    subgraph Product_development [Product development]
        direction TB
        SCD[Satellite-derived ECV CDRs]
        IRD[Independent reference data]
        EQI[Establishment of Quality Indicators]
        TQA[Toward "Quality Assured" ECV CDRs]
    end

    SCD --> EQI
    IRD --> EQI
    EQI --> TQA

    TQA --> E
    E --> IRD
    E --> EQI
    EQI --> E
    EQI --> FFE[Evaluation of "fitness-for-purpose" by data user]
    FFE --> EQI
    EQI --> IEQ[Independent QA evidence « check »]
    IEQ --> EQI
    
```

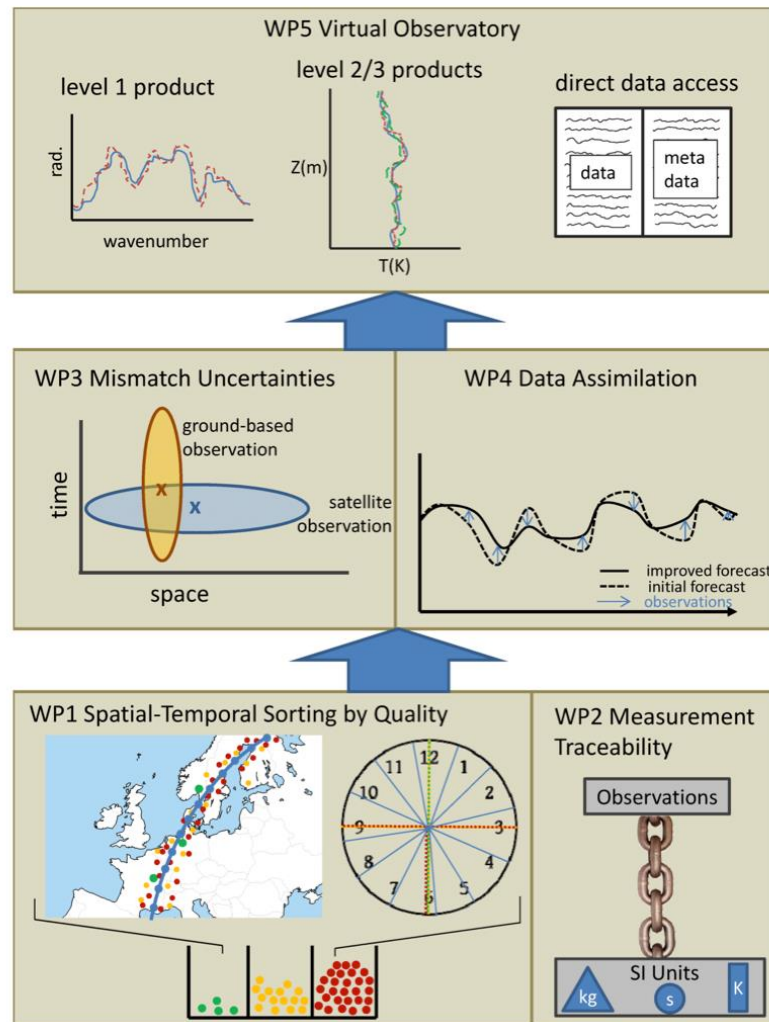
The QA system is the ensemble of interconnected documents and tools guiding and supporting the progressive establishment of quality assurance (QA), that is, evidence that prevailing quality criteria are met in retrieving, validating and delivering a satellite-derived ECV data record.

The QA4ECV QA system mainly consists of

- a [documentary framework](#) including the description of the system itself and guidelines intended to whoever

IN DEVELOPMENT !

- Goal: to improve our ability to use ground-based observations to characterise satellite observations for several atmospheric ECVs
- GRUAN, NDACC, TCCON PIs + EUMETSAT + validation experts
- Metrological traceability
- WP2 on ground-based data uncertainties
- WP3 on 3D aspects of measurement uncertainties and of comparison error budget
- Data assimilation feedback on data quality
- Virtual Observatory – Visualisation and validation tools, heritage of ICARE, Multi-TASTE/CCI-Ozone, NORS, NPROVS



QA4ECV

Land-Atmosphere Workshop



Participants:

- QA4ECV partners + externals, 50+

Sessions:

- Limitations applying to the inclusion BRDF in Radiative Transfer Models
- Impact of thermal infrared surface emissivity uncertainty on trace gas retrieval

Seed questions:

1. How relevant are BRDF effects on top-of-atmosphere reflectance levels and cloud retrievals? Especially in the context of large satellite pixels and residual aerosol layers.
2. How can BRDF be incorporated in radiative transfer simulations for Air Mass Factors and cloud retrievals?
3. What BRDF data sets are currently available at 440nm (NO₂) and 340nm (HCHO), and what is their spatial resolution and temporal coverage (needed: 1995-2015). Can such data be produced within QA4ECV?
4. How can the retrieval of spectrally resolved emissivity improve trace gas retrievals over bright surfaces?



Joint Workshop on Confidence in Climate Services



Confidence in Climate Services Presenting uncertainty with confidence

Date: Monday 15th, 1p.m. - Wednesday 17th
February 2016, 1 p.m

Venue: Hamburg,
Climate Service Center Germany

Participants:

- Convenor: CLIPC (Climate Information Platform for Copernicus)
- Organizers: CLIPC, EUCLEIA, EUPORIAS, QA4ECV
- CCI, FIDUCEO, GAIA-CLIM...
- Copernicus Climate Service, ECMWF, EEA, Portals, users...

Key topics:

- Assessing uncertainty
- Communication of uncertainty
- Infrastructure needs





Thank you!

Coordinators / Points of contact:

CORE-CLIMAX: B. Su (ITC/Twente University, NL)

QA4ECV: F. Boersma (KNMI, NL)

GAIA-CLIM: P. Thorne (Maynooth University, IRL)

Fiduceo: C. Merchant (U. Reading, UK)

