ACTRIS
CCRES

Labelling Process - Focus on Step 1b

CCRES/CLU

CCRES/CLU Autumn Workshop, Evora, 22 October 2025

Outline

1. **ACTRIS labelling process**

2. **Status of National Facilities for step 1b**

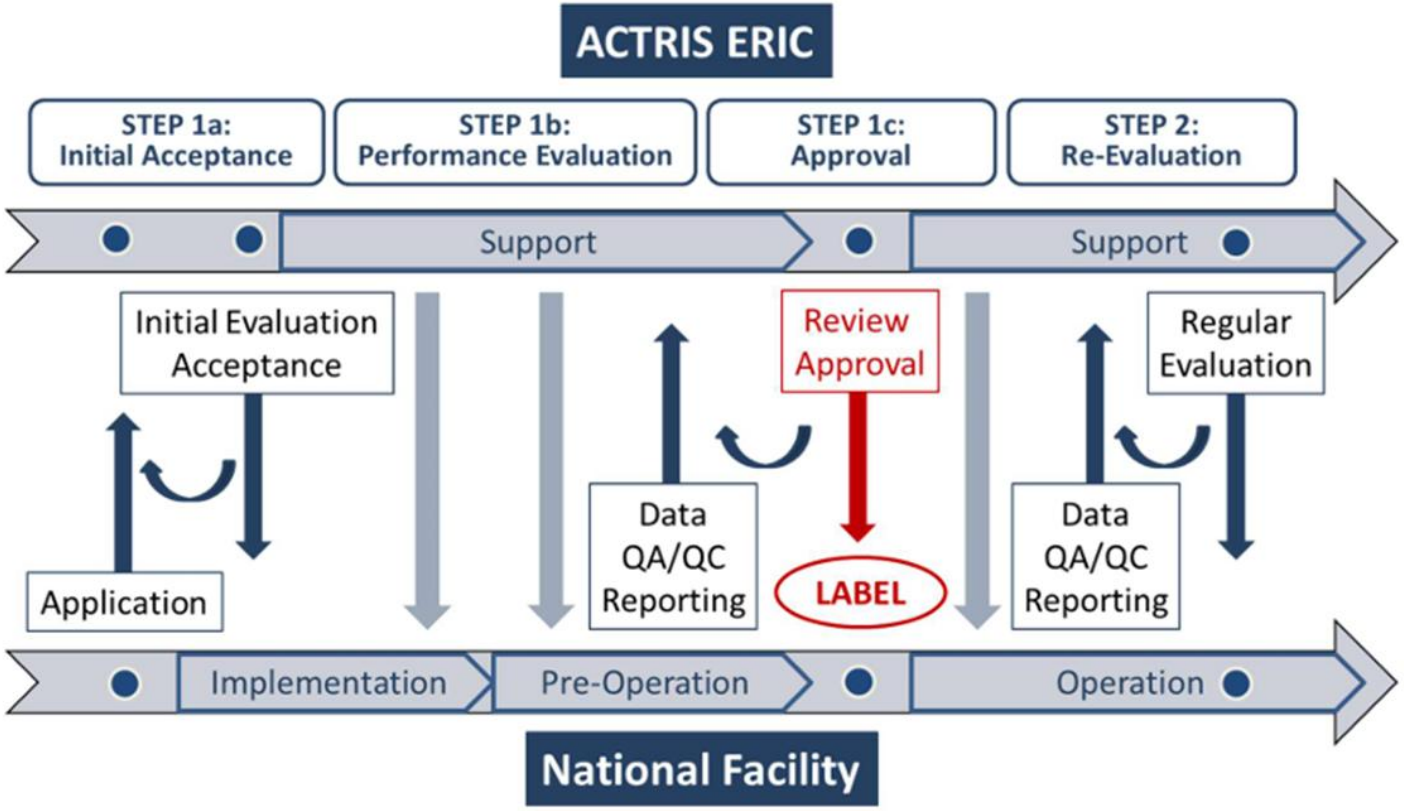
3. **CCRES step 1b procedure**
   a. What needs to be validated ?
   b. ACTRIS Head Office requirements
   c. CCRES specific process
      i. Conformity matrix
      ii. Logbook
      iii. To-do list for NFs

4. **Data availability and quality**

ACTRIS labelling process

A stepwise labelling process to monitor the progress of the National Facilities and validate the compliance to CCRES requirements over a period of two years.

→ long journey…



ACTRIS labelling process

- **Step 1a: Initial acceptance (duration: up to NFs)**
  - General feasibility check, collect of information on variables, instruments and personnel
  - Compliance with CCRES requirements

- **Step 1b: Performance evaluation (minimum duration: 24 months)**
  - Data flow and operation support schedule created
  - Tracking of NF data
  - Upgrade of the facility (if necessary → duration longer than 24 months)
  - Compliance with CCRES/CLU data requirements

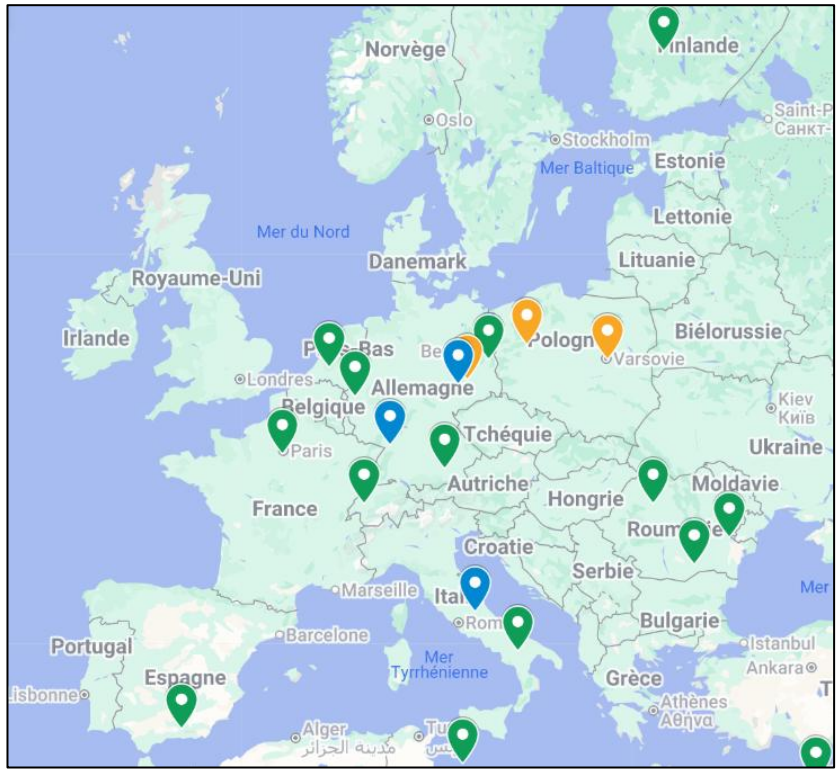
- **Step 1c: Approval**
  - Full label is granted.
  - Signature of ERIC and NF agreement.

- **Step 2: Re-evaluation**

NF submit data, metadata, HKD data to CLU

• CCRES and CLU are developing and implementing
- Daily diagnostics and visualisation of HKD
- Monthly reports of HKD
- Quality control of metadata conformity
- Quality tests and control of geophysical data

Update on Labelling step 1a and step 1b : NFs status



16 NFs accepted for step 1a (NF in the step 1b labelling process for more than 24 months) **:**

- **Bucharest, Romania**
- Cabauw, The Netherlands
- Cluj, Romania
- **Galati, Romania**
- Granada, Spain
- **Hyytiälä, Finland**
- **Jülich, Germany**
- Lampedusa, Italy
- Limassol, Cyprus
- **Lindenberg, Germany**
- Maïdo, La Réunion
- Mindelo, Cabo Verde
- Munich, Germany
- **Palaiseau, France**
- Payerne, Switzerland
- Potenza, Italy

\+ *4 NFs in the process for initial acceptance*

Step 1b: What needs to be validated?

Once a station has been granted the labelling initial acceptance, CCRES submits an **annual evaluation assessing the number of months of compliant operation** to the Head Office at the beginning of **each calendar year**, attesting that during the previous year, the National Facility has followed CCRES and CLU recommendations for their nominal instruments, regarding :

- Implementation of the **SOPs**
- The implementation of the **upgrade plan** (if needed)
- **Calibration** procedures
- **Maintenance** and regular check-ups of the instruments
- The **availability** and **quality** of data

Step 1b: The Head Office rules

ACTRIS Head Office statement about general principles for all Central Facilities

75% Data coverage rule

- Excludes periods when external factors (e.g., instrument maintenance, unsuitable weather conditions, …) prevent valid data
- Coverage is assessed per variable, not per instrument
  - All required instruments must be operational simultaneously for a variable to be validated

Note for mobile facilities

- All components should be labelled simultaneously
- Audits will be conducted by each TC, with recommendations to follow
- The step 1b statement will be provided by the Mobile Platforms Coordination Group (MPCG)

Final evaluation

- **Granted:** once **24 months of compliance is reached in a 36 months period**, a NF receives a certificate of step 1b completion and is thus approved for step 1c.
- **Full label** is expected to happen **within 5 years from the initial acceptance**

Step 1b: How are we going to proceed at CCRES

- A **conformity matrix** enables the PIs and CCRES/CLU to have an overview of the status of step 1b and exchange around the missing actions.

- The PIs inform CCRES/CLU every time an action is done on an instrument, through the **logbook**.
  - The frequency and type of actions required are detailed in the **"to-do list"** (slides after).

Criteria for step 1b	**Verification** *! Specific rules for validation to be detailed !*
Implementation of the SOPs	Logbook *(based on the to-do list)*
The implementation of the upgrade plan (if needed)	Conformity matrix
Calibration procedures	Logbook *(based on the to-do list)*
Maintenance and regular check-ups of the instruments	Logbook *(based on the to-do list)*
The availability and quality of data	CCRES and CLU tracking

Step 1b: the conformity matrix

Example for the SIRTA (preliminary version) :

		NF		CCRES & CLU					
Instruments information		**Upgrade plan**		**SOPs implementation verifications**			**Data availability over 12 months period (%)**		
Model	PID	Planned upgrade for the instrument	Implementation status	Maintenance	Calibration	Check-up	Data conformity to SOPs	Percentage of available data	Comments
BASTA FMCW 94 GHz	https://hdl.handle.net/21.12132/3.643b7b5b43814e6f	None	N/A						
RPG HATPRO G5	https://hdl.handle.net/21.12132/3.770aaf228a974dd6	None	N/A						
Lufft CHM15k	https://hdl.handle.net/21.12132/3.b14e15ec9c9b43fb	None	N/A						
Vaisala WLS400S	https://hdl.handle.net/21.12132/3.455010e11c0545ae	Vaisala wind lidar 400S instead of Vaisala WLS70	OK						

Step 1b: Logbook

Logbook : overall structure → make the link between NFs, CLU and CCRES

NF	PI	Date of the action	Instrument	Status of the instrument	Details	Type of operation	Action
name of the station (select)	*name of the instrument PI (or person filling the form)*	*date of the operation*	**DCR**	Operational	/	Maintenance	Change of radome (RPG only)
						Calibration	*Type of calibration*
						Check-up	Amplifiers (no degradation)
				Not operational	*explain the issue*	Reparation	*fill*
						Not in reparation yet	*date of planned reparation*
				Campaign	*dates of the campaign*	/	
			MWR	Operational	/	Maintenance	Change of the radome
							if cold (<0°C) blower openings have to be covered with foam inlets in winter
						Calibration	LN2 calibration
						Check-up	
				Not operational	*explain the issue*	Reparation	*fill*
						Not in reparation yet	*date of planned reparation*
				Campaign	*dates of the campaign*	/	
			ALC	Operational	/	Maintenance	Cleaning of the window
							renew drying agent in CHM
						Calibration	Dark measurements
						Check-up	If NTP status is not reported, check and correct internal time of device
				Not operational	*explain the issue*	Reparation	*fill*
						Not in reparation yet	*date of planned reparation*
				Campaign	*dates of the campaign*	/	

Step 1b: To-Do List for NFs

Will be sent to NFs

List of recommendations to guide the process

→ encourage everyone to follow them as closely as possible

1. Doppler Cloud Radar (CCRES-FR)

Frequency	Maintenance	Calibration	Check-ups
Daily			quicklooks/data sent to CLU and Grafana alerts
Weekly			Radome quality
Monthly	Change radome if needed		• Radome condition (still coating ?) • Whether blower and heater are working properly (RPG radars) • Transmitter, receiver and radar PC temperatures (RPG radars)
Every 6 months	Change radome (RPG only)	Calibrate the radar receiver with LN2 or clear sky technique (RPG only)	
Annually			Check amplifiers aging through transmitted power (Grafana)

To be finalised

To-Do List for NFs

2. Microwave Radiometer (CCRES-DE)

Frequency	Maintenance	Calibration	Check-ups
Daily			quicklooks/data sent to CLU and Grafana alerts
Weekly			Check radome and the IR window
Monthly			• radome quality • whether blower and heater operation • temperature stability plots
Every 3 months			
Every 6 months	• change radome (if needed) • cover the blower openings with foam inlets during the winter (<0°C)	LN2 calibration : send calibration LOG to CCRES	
Annually			

To-Do List for NFs

optional instrument

3. Doppler Lidar (CCRES-FI)

Frequency	Maintenance	Calibration	Check-ups
Daily			quicklooks/data sent to CLU and Grafana alerts
Weekly			
Monthly			• Check scanner is actually scanning • Check internal humidity (and window fogging) • Check levelling
Every 3 months			
Every 6 months	• Replace desiccant (Vaisala systems)		• Check azimuth pointing angle manually if no pointing scan is included in scan schedule
Annually			

To-Do List for NFs

4. ALC (CCRES-FR+CARS)

Frequency	Maintenance	Calibration	Check-ups
Daily	during the winter : remove snow		quicklooks/data sent to CLU and Grafana alerts
Weekly			• unusual noises (blower), dirt, condensation • grafana checks
Monthly	clean the environment		NTP status : if not reported, correct internal time of device
Every 3 months		dark measurements for new instruments	
Every 6 months			
Annually	renew drying agent in CHM	• dark measurement if no variability during the first year of operation • CL51: dark measurement over 24h	

To-Do List for NFs

5. Disdrometer (CCRES-FR)

Frequency	Maintenance	Calibration	Check-ups
Daily			quicklooks/data sent to CLU and Grafana alerts
Weekly	clean the windows and remove insects/grass/spiders		
Monthly			Laser status on Grafana
Every 3 months			
Every 6 months			
Annually			

To-Do List for NFs

6. Weather station (CCRES-FR)

Frequency	Maintenance	Calibration	Check-ups
Daily			quicklooks/data sent to CLU and Grafana alerts
Weekly			
Monthly			
Every 3 months			
Every 6 months	Clean the wind-speed sensor	Follow the manufacturer and met office recommendations (RH sensor for ex.)	
Annually			manufacturer check-ups recommendations for compact weather stations

To-Do List for NFs

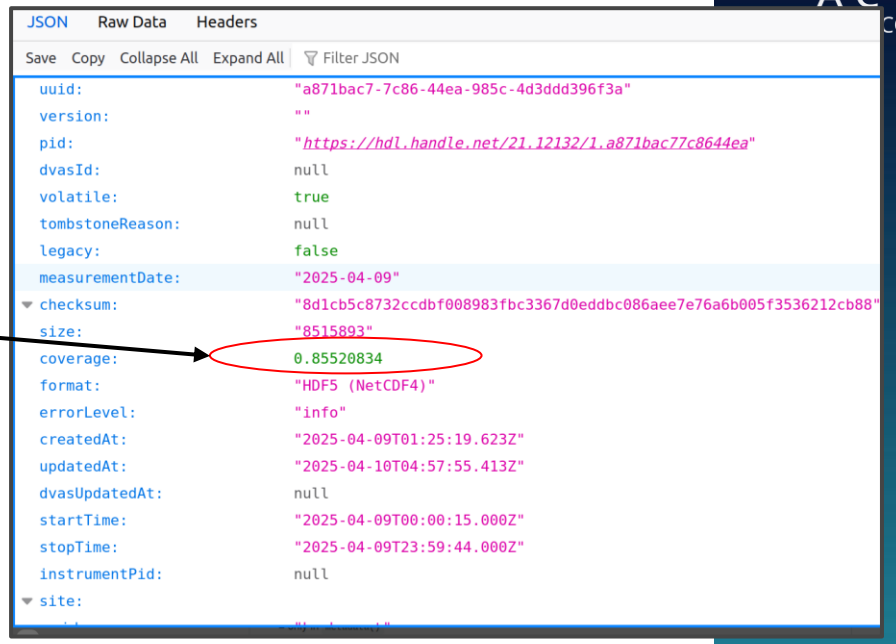
7. Raingauge (CCRES-FR)

Frequency	Maintenance	Calibration	Check-ups
Daily			Quicklooks/data sent to CLU and Grafana alerts
Weekly			Check the tipping bucket or weighing rain gauge collector and clean if necessary
Monthly			
Every 3 months			
Every 6 months		Raingauge sensor calibration (follow the manufacturer or met office recommendations)	Open the rain gauge and check the bucket
Annually			

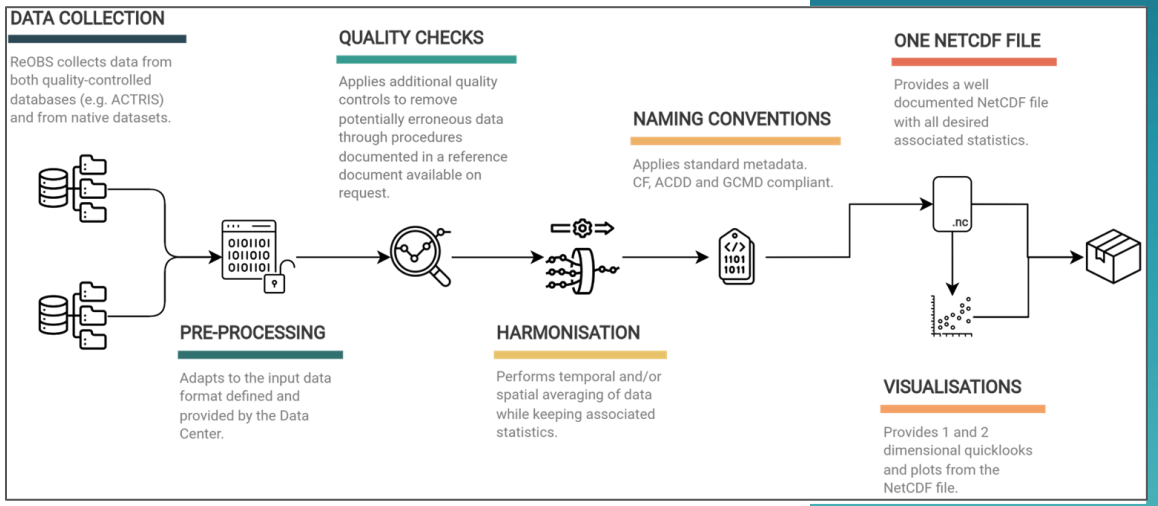
Step 1b: Data availability and quality

2 levels of assessment

- **Data Availability**
  - NFs' files uploaded to Cloudnet
  - Check if minimum of data coverage
  - Information provided by CLU (now available)



- **Data Quality**
  - Use of ReOBS tool (Chiriaco et al., 2018) to synthetize all products into a single .nc with temporal resolution 1h and same vertical grid
  - Additional QCs are used (generally more restrictive flags/status associated with initial products)
  - Documentation: [link]



Step 1b: Data availability and quality

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Data quality derived from ReOBS

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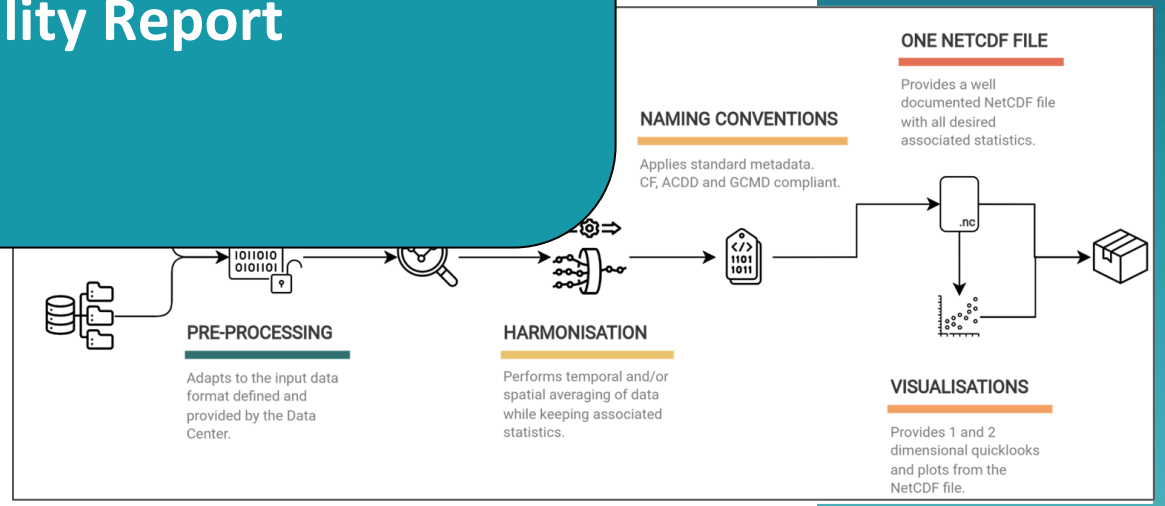
Cloudnet quality Report



Version 1

Step 1b: Data availability and quality

Data Availability (Cloudnet)

Based on data coverage (%) provided by the CLU:

- A predefined sampling interval is expected, e.g., at least one measurement every 30 seconds.
- The full day is divided into fixed-length time bins (e.g., 30 s), and the ratio of non-empty bins to total bins is computed.
- The expected sampling resolution depends on the instrument type:
  - Radar and lidar: 30-second bins
  - Disdrometer: 1-minute bins
  - Weather station: 10-minute bins
- Daily data coverage is then retrieved, and a monthly average is computed for each product.

Data Quality (ReOBS)

- A set of core variables is defined for each product (e.g., reflectivity and Doppler velocity for radar).
- For each hourly time step, the presence of at least one valid value across relevant dimensions (e.g., height, velocity, diameter) is checked.
- If at least one valid value is found, the time step is considered valid.
- The ratio of valid hourly time steps over the total is computed, yielding a daily percentage of potentially valid quality data.
- A monthly average is then calculated, following the same approach as for availability.

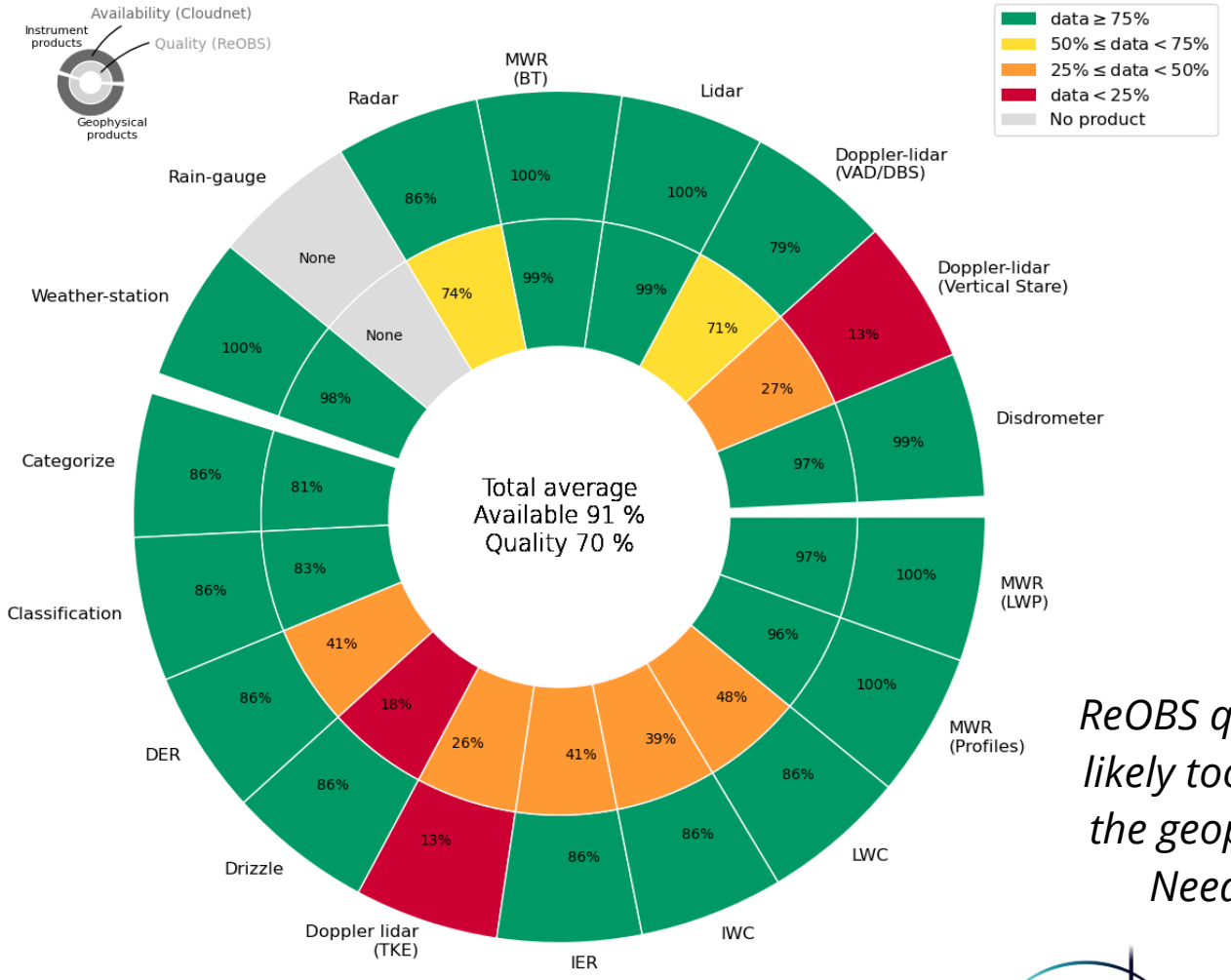
Step 1b: Data availability and quality

List of evaluated products (18 max)

#	Instrumental Products	Geophysical Products
1	Disdrometer	Categorize
2	Doppler Lidar (Vertical Stare)	Classification
3	Doppler Lidar (VAD/DBS)	DER
4	Lidar	Doppler Lidar (TKE)
5	MWR - L1c (brightness temp.)	Drizzle
6	Radar	IER
7	Rain-gauge	IWC
8	Weather Station	LWC
9		MWR-multi (temperature profiles, ...)
10		MWR-single (LWP, ...)

Step 1b: Data availability and quality

Palaiseau (48.717°N, 2.209°E, 156m)
From 2023-04-01 to 2025-09-30



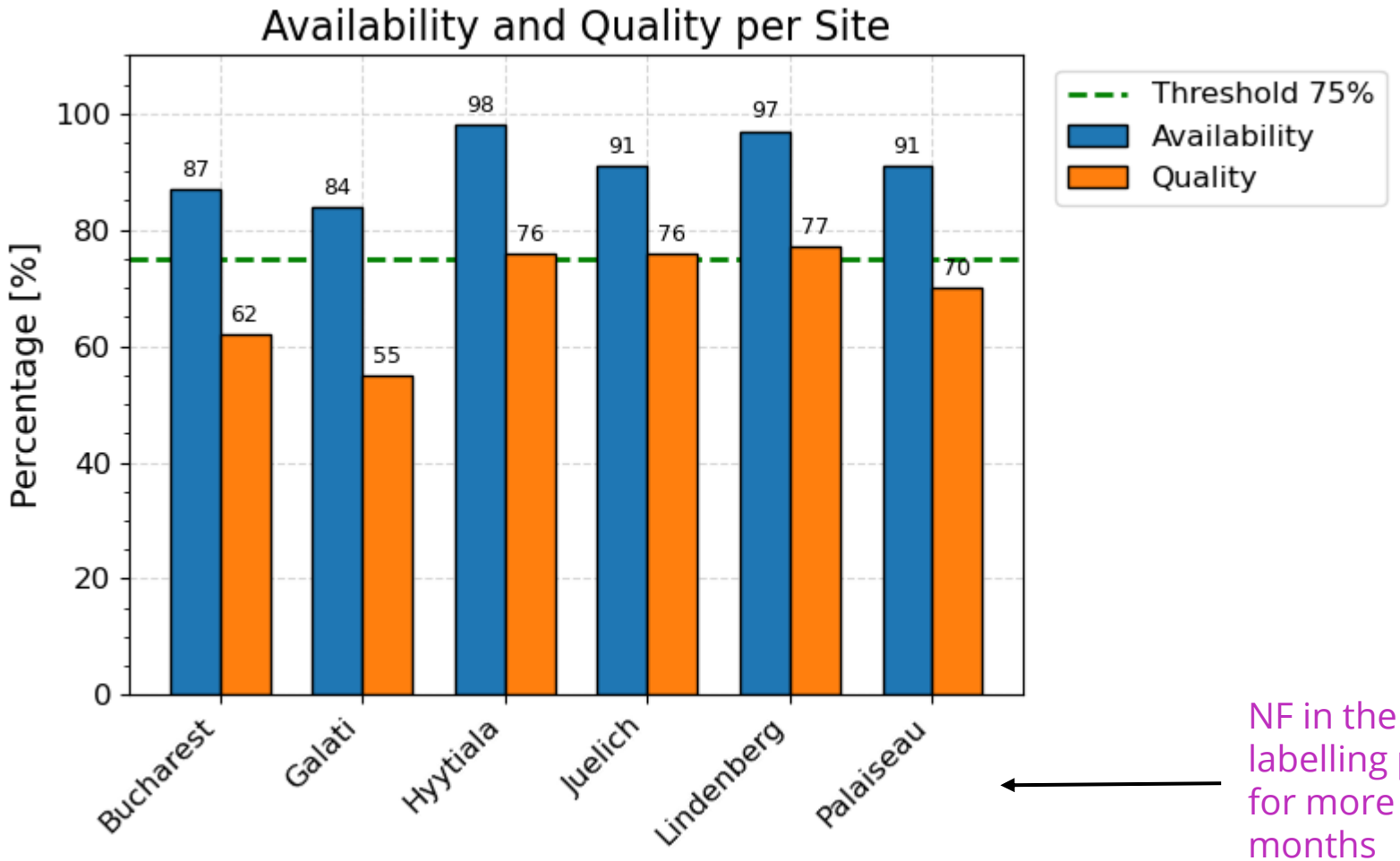
Should be available soon on the CCRES website for each NF in step 1a

ReOBS quality controls are likely too strict for most of the geophysical products. Need to work on it.

Version 1

Step 1b: Data availability and quality

Preliminary results (from methodology version 1)



NF in the step 1b labelling process for more than 24 months

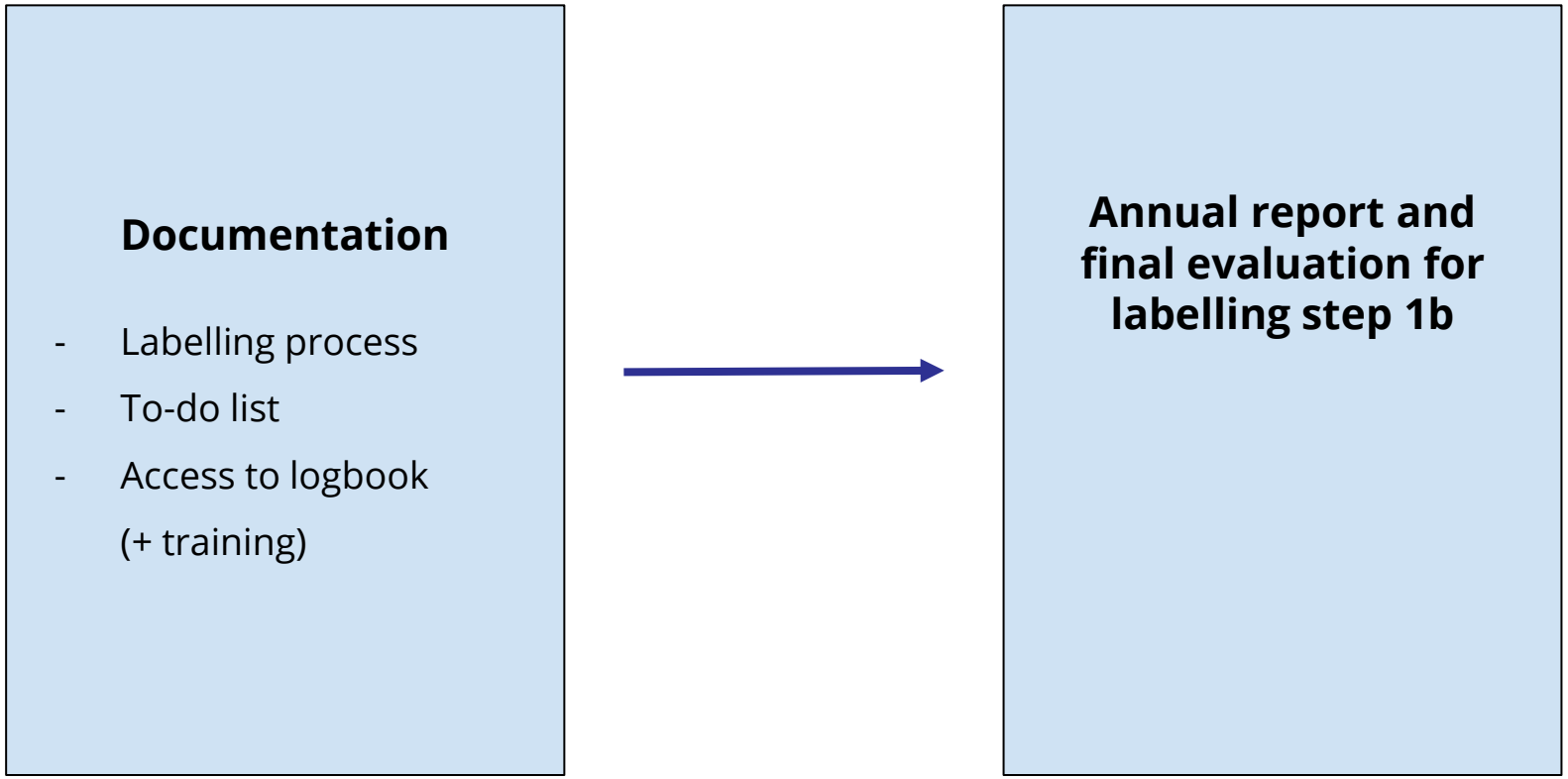
Step 1b: Data availability and quality

Some comments/limitations of version 1:

- Most of the successive instruments for a NF should have been taken into account
- About "number of hourly time steps with at least one valid data point"
  - For a product with 5 variables, if only 1 is valid and the other 4 are not, all 5 are still considered valid
  - Maybe we should define a subset of “super-core” variables that must be valid by default ?
- Maintenance / repair periods still need to be considered → logbook
- Some bad data or problematic periods are sometimes not filtered out

Step 1b: Data availability and quality

1. Prepare and share full documentation for Step 1b → on-going
2. Provide a template for the final evaluation report → to do



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Thank you !

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