



Contribution to the observing system in the Arctic and sub-Arctic regions

ACTRIS INTAROS discussion, 10/02/2021



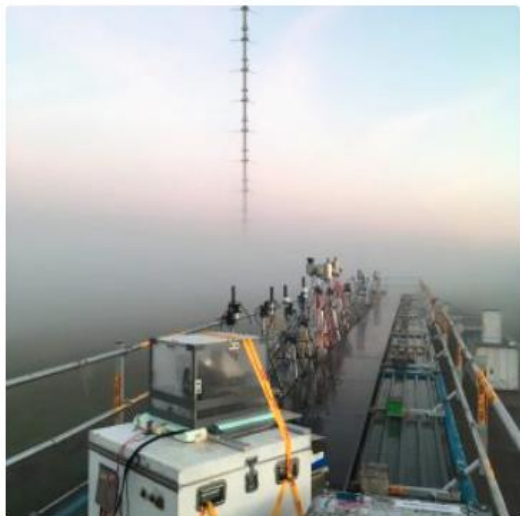
This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreements No 871115

What is ACTRIS?

ACTRIS –Aerosol, Clouds and Trace Gases Research Infrastructure

pan-European research infrastructure producing high-quality data and information on short-lived atmospheric constituents and on the processes leading to the variability of these constituents in natural and controlled atmospheres.

ACTRIS is key to supporting scientific advances in the field of atmospheric research





ESFRI

ESFRI project since 2016



22
countries
involved

>120
RPOs



17
countries
in IAC

260
planned
facilities



ACTRIS COMMUNITY

~150 scientists technicians working in
European level of ACTRIS

~800 scientists and technicians working
at National level



ACTRIS services



Physical Access

Research Services
Instrument calibration
Industry Services
Training services



Instrument calibration

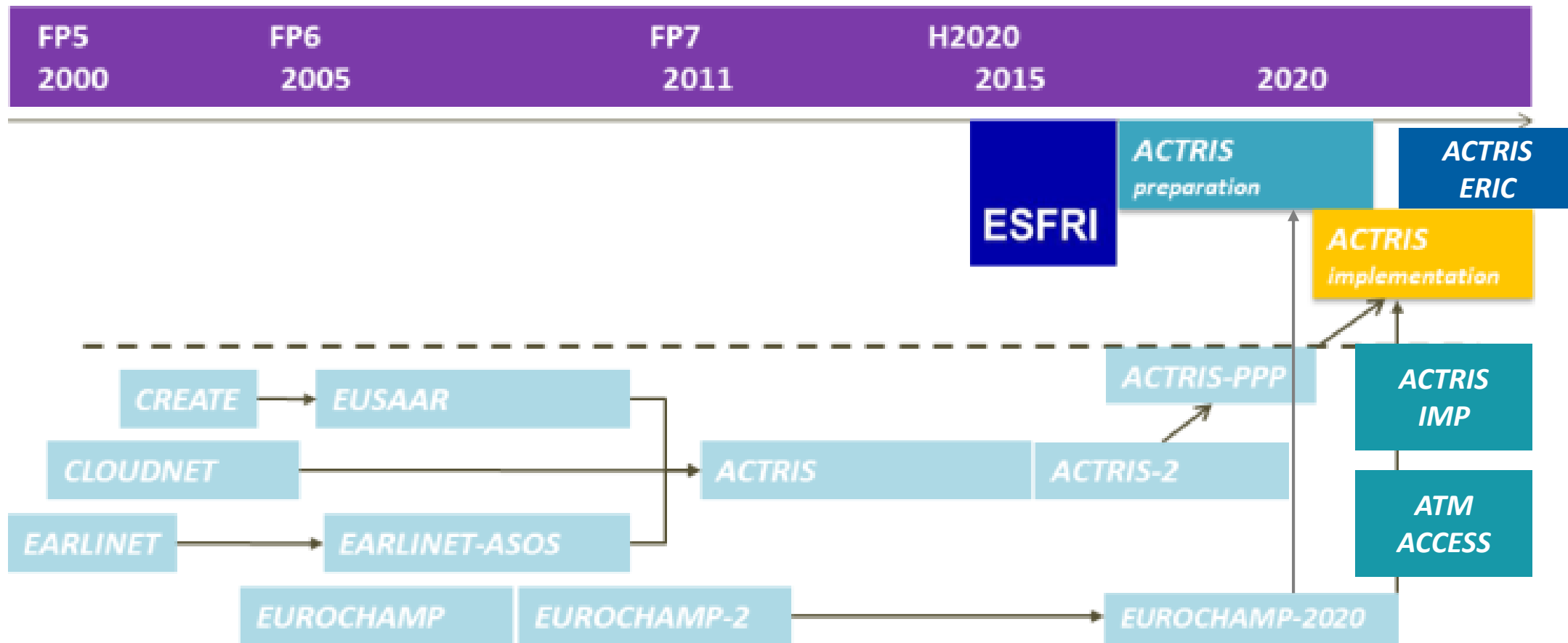


Virtual Access

ACTRIS data products
ACTRIS VRE with graphic
and computing tools

NF aerosol, cloud and trace gas variables





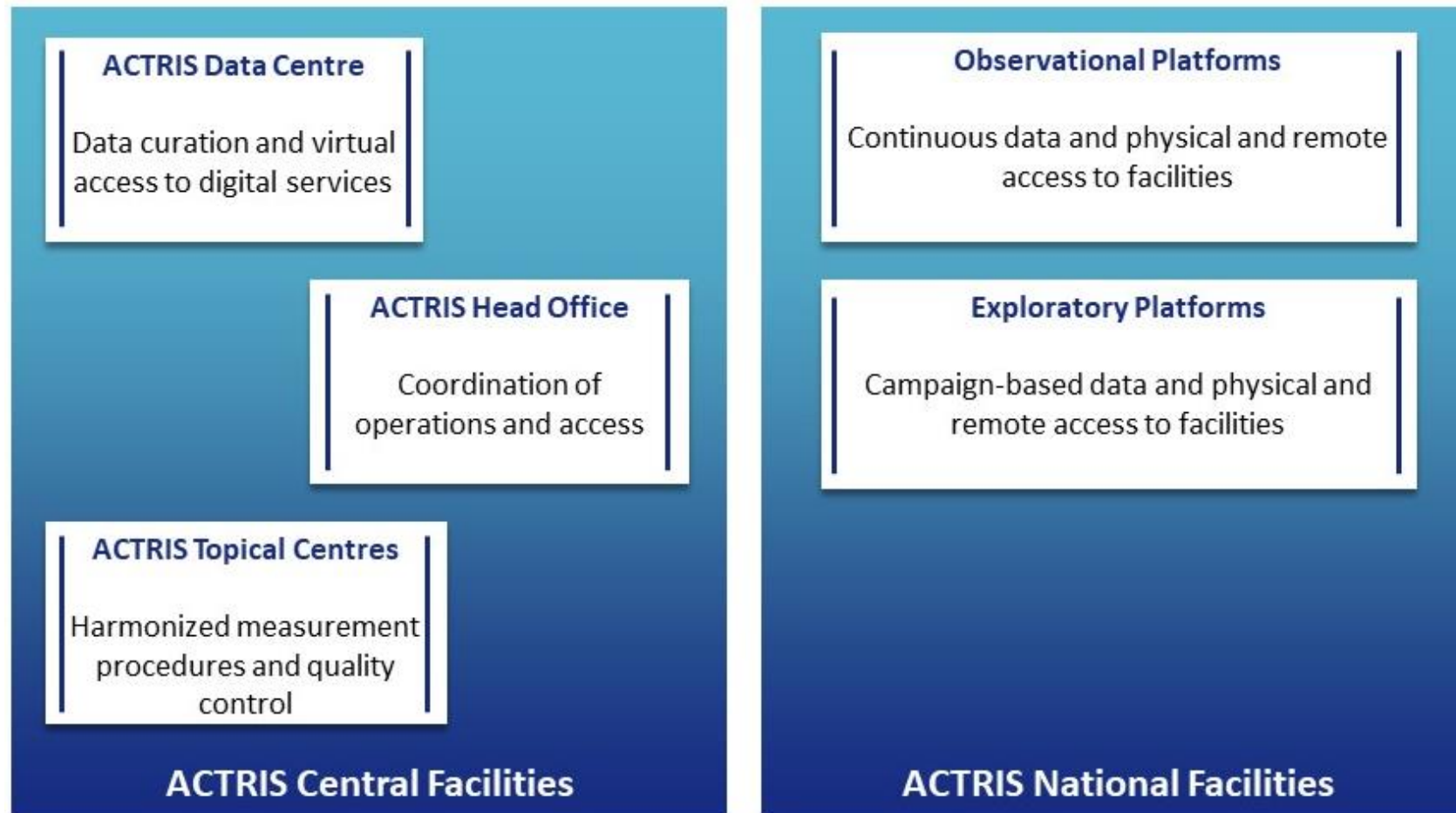
ACTRIS heritage, the dashed line separates the EC-funded projects (below) from the research infrastructure (above)

The current status of ACTRIS

- ACTRIS ERIC will be established as legal entity in end 2021 early 2022
- Long term commitment for operation with a time perspective of ca. 35 years
- Sustainable funding for the ACTRIS Central Facilities and National Facilities will be secured

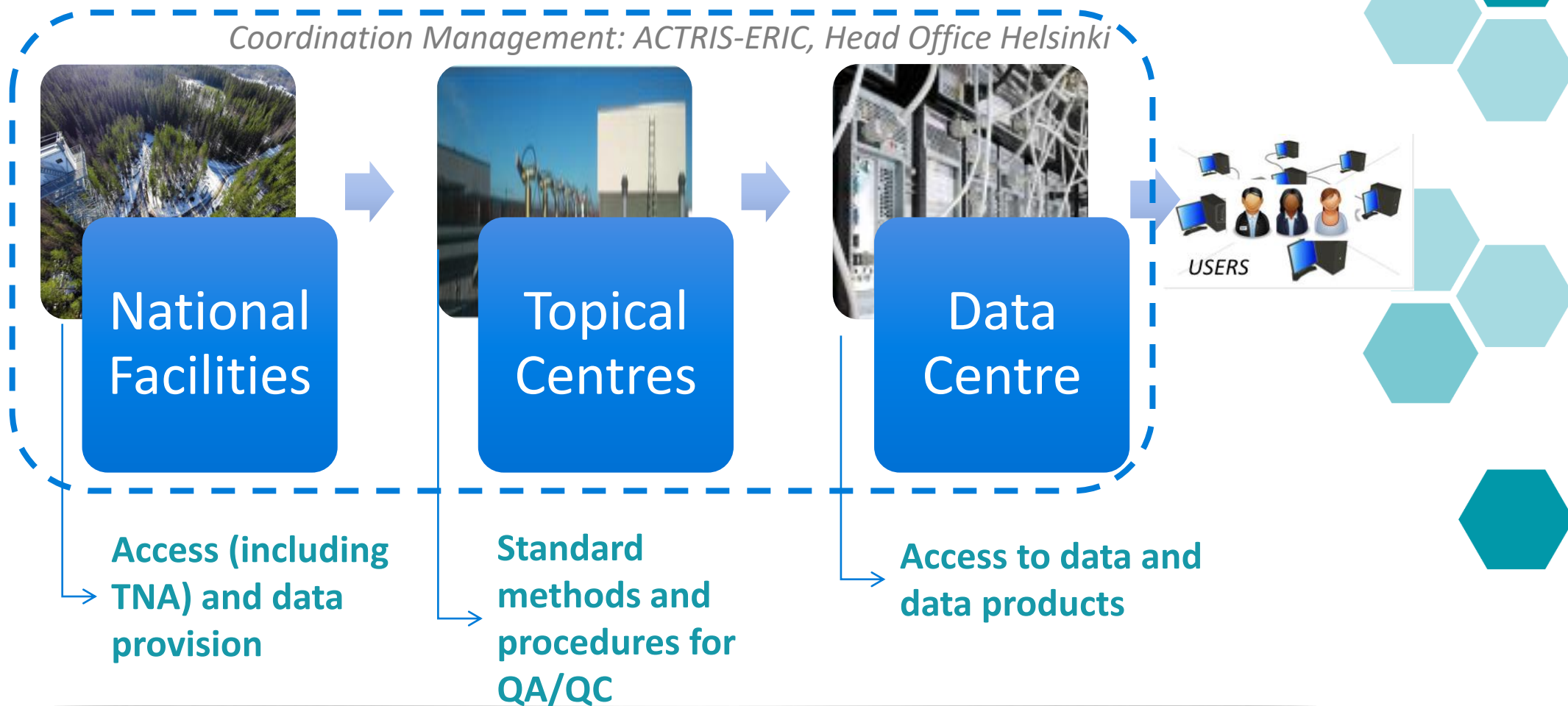


The core components of ACTRIS: National and Central Facilities



The main organisation of ACTRIS

A community of countries sharing



The Main ACTRIS Variables

	In-situ near surface	Column Integrated	Profiling
Aerosol	Chemistry, Size, Scatt, Abs. (BC-related)	AOD (and retrived parameters)	Aerosol Extinction
Trace gases	VOC, NOx	NO ₂ , HCHO, O ₃	O ₃ , NO ₂
Clouds	LWC, Re	LWP	LWP, Type of Hydrometeors Cloud Phase

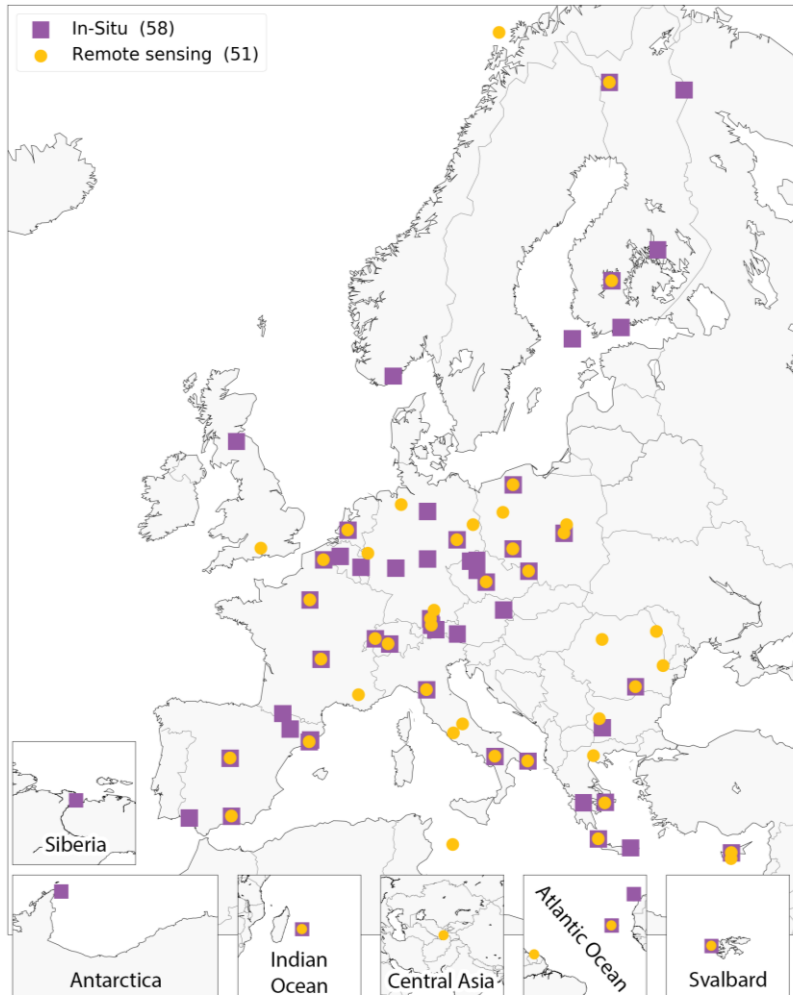
ACTRIS and the Aerosol ECVs

CURRENT GCOS (2015-2020)	PROPOSED GCOS (2021-2025)	Main Procedures
Optical Depth	Optical Depth	Photometers
Extinction profile	Extinction Profile	Lidars
Layer Height	<i>Abandoned</i>	Lidars, Others
Single Scattering Albedo	Single Scattering Albedo	Retrieved
	Number Size Distribution	Spectrometers, counters, retrieved
	Chemical composition	Analysis, spectrometers
	Cloud Condensation Nuclei Concentration	Counters, retrieved

Topical Centres in ACTRIS

	In-situ near surface	Column Integrated	Profiling
Aerosol	ECAC	CARS	
Trace gases	CIGAS	CREGARS	
Clouds	CIS	CCRES	

The ACTRIS network of observing stations



A number of stations are operational in the Arctic or Sub-Arctic area:

- **ZEP (NO)** – ECAC, CIGAS
 - **TIKSI (RU, FI)** - ECAC
 - **VAR (FI)** – ECAC, CIGAS, CIS
 - **PAL (FI)** – ECAC, CIGAS, CIS, CCRES
 - **ALO (NO)** - CARS
-
- Commitment from Countries to engage in long-term monitoring activities

Beyond ACTRIS = The GAW network

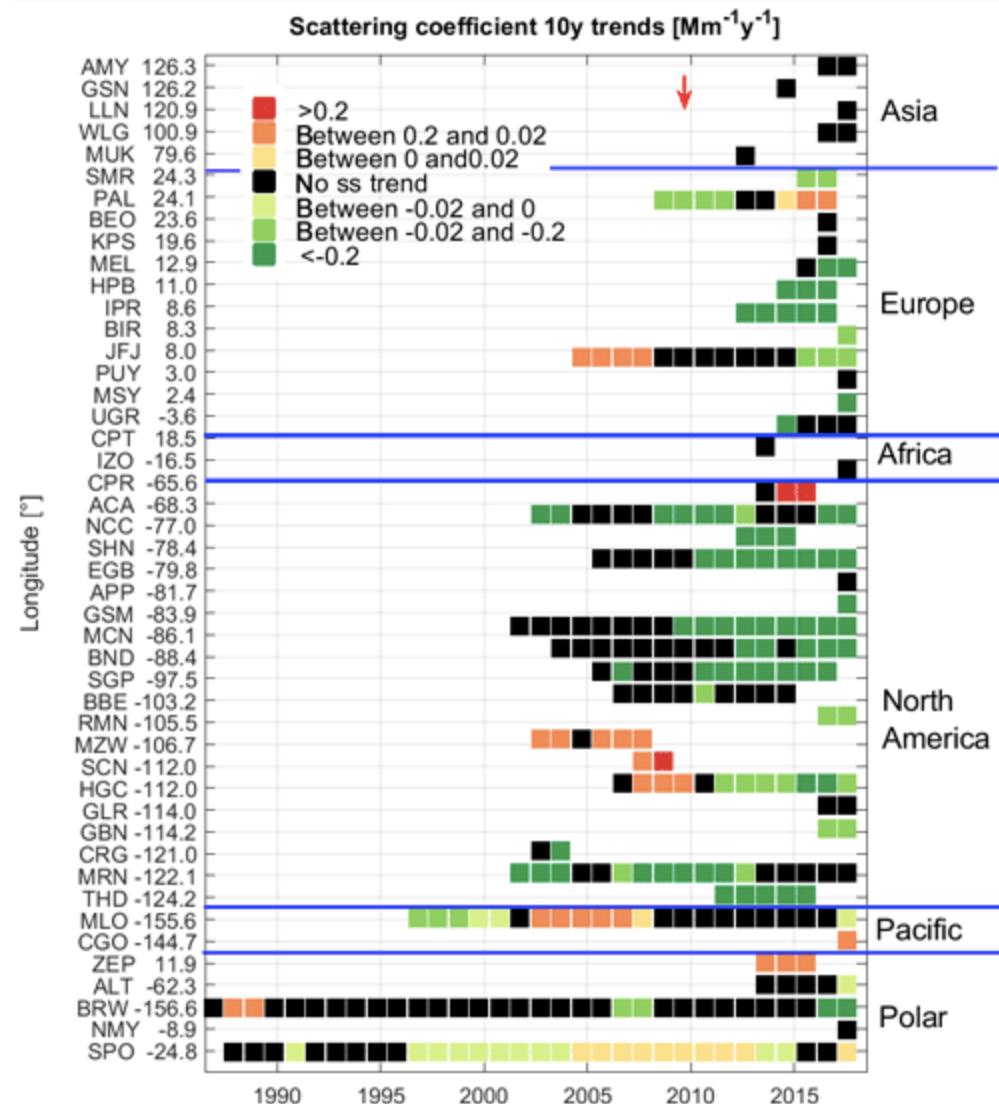
Recent Aerosol Global assessment (in-situ near surface)

(Laj et al., 2020, Colleau Coen et al., 2020a, Colleau Coen et al., 2020b, Glib et al., 2021, Mortier et al., 2021, Rose et al., 2021)

- ZEP (NO)
- TIKSI (RU, FI)
- PAL (FI)
- ALT (CA)
- BRW (US)

Limited number of stations

Providing Abs. Coeff, Scatt Coef, number concentration / size distribution, composition



Beyond ACTRIS = International networks

Lidar Network GALION (MPLNET, EARLINET-ACTRIS)

- ALO (NO)
- FAIRBANKS (US)
- Eureka, Nunavut (CA – to be installed)

NDACC : Mainly O3 data through TOAR

AERONET: several stations operating in the ARCTIC region

Clearly, the ARCTIC remains undersampled with limited number of sites operational in international networks



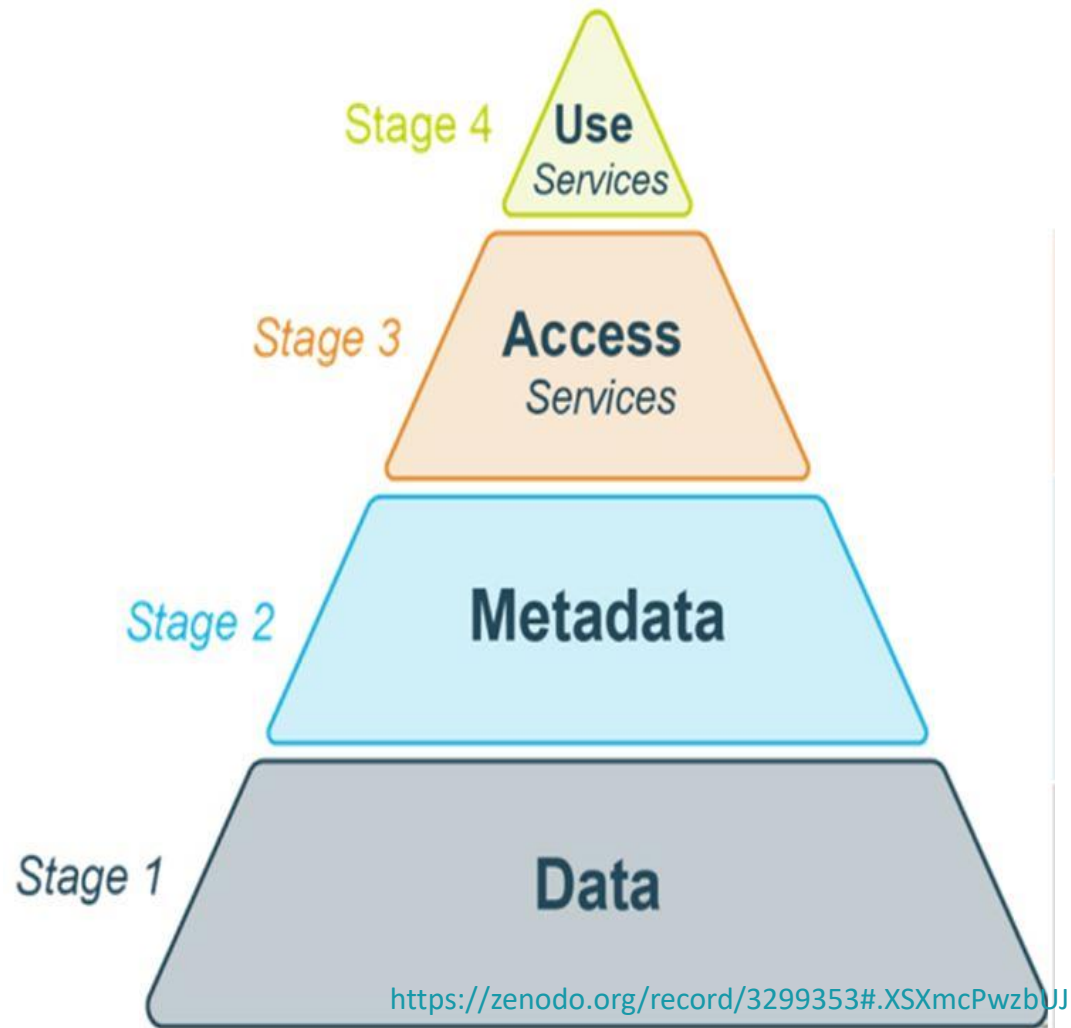
Towards Real-Time Data availability

ACTRIS is contractually engaged with CAMS (Copernicus Atmosphere Services) to provide Aerosol Variables in RT or NRT (3h-delay)

- Aerosol in-situ (CAMS21a)
- Aerosol Profile (CAMS21b)
- Pilot projects to prepare for the provision of high quality data in NRT online.



ACTRIS DC interoperability in the ENVRI framework



ACTRIS is one of the 13 RIs participating in ENVRI-FAIR (H2020, 2019-2023)

ENVRI-FAIR is a joint project of ENVRIIs (also including other RIs operating in the Arctic) to define and implement FAIRness in ENVRI DC

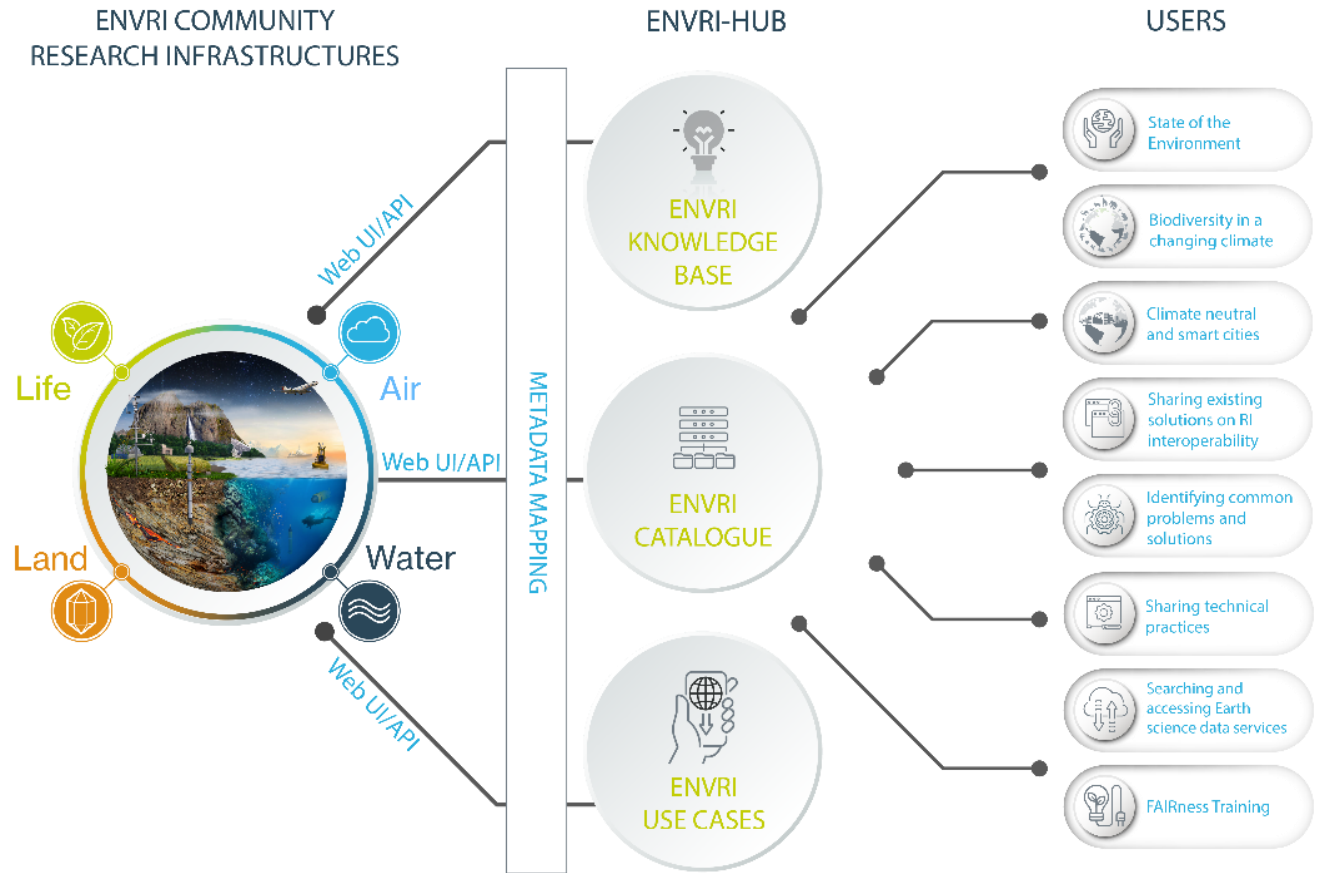
Facilitate uptake of RI services by users through adoption of common standards and common policies on data, metadata, access and services

ACTRIS DC in ENVRI-HUB

ENVRI-HUB may become the future platform for accessing ENVRI services (although operations remain at RI level)

ENVRI-HUB may facilitate search based on geographical criteria (i.e. Arctic)

Developments are ongoing. Long-term sustainability is being discussed



<https://zenodo.org/record/3299353#.XSXmcPwzbUJ>



ACTRIS

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