



Project overview

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National Research Council of Italy

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At a glance

- Title:** Aerosols, Clouds, and Trace Gases Research Infrastructures Network
- Instrument:** Combination of Collaborative Project (CP) and Coordination and Support Action (CSA), FP7 Capacities specific programme for Integrating Activities - Research Infrastructures for Atmospheric Research
- Budget:** 7.8 M€ (total costs: 11.5 M€)
- Duration:** 2011 – 2015
- Consortium:** 29 Partners from 19 countries
- Project**
- Coordination:** Dr. Gelsomina Pappalardo (CNR-IMAA, Italy) – Coordinator
Dr. Paolo Laj (CNRS-LGGE, France) – Co-Coordinator
- Project Website:** www.actris.net

29 Partners from 19 Countries

	Consiglio Nazionale delle Ricerche
	Centre National de Recherche Scientifique
	Norsk Institutt for Luftforskning
	Helsingin Yliopisto (FI)
	Technische Universiteit Delft
	Paul Scherrer Institut
	Leibniz Institut fuer Troposphärenforschung e.V.
	Eidgenoessische Materialprüfungs- & Forschungsanstalt
	University of Reading
	Universitat Politecnica de Catalunya
	Max-Planck-Institut für Meteorologie
	Lunds Unviersitet
	Agencia Estatal Consejo Superior
	National University of Ireland, Galway
	Natural Environment Research Council

	Foundation for Research and Technology, Hellas
	Commission of the European Communities, DG JRC
	Deutscher Wetterdienst
	B.I. Stepanov Institute of Physics
	Institute for Nuclear Research + Nuclear Energy
	Uniwersytet Warszawski
	Consorzio Nazionale Interuniversitario
	National Institute of R&D for Optoelectronics
	Ludwig-Maximilians-Universitaet Muenchen
	Czech Hydrometeorological Institute
	Pannon Egyetem
	Belgian Institute for Space Aeronomy
	Universidad de Valladolid
	Meteorologisk Institutt

Plus 50 associated partners for a total of more than 90 research groups involved

Sustainable network of coordinated long-term atmospheric observations in Europe

- ❖ High-quality data relevant to climate and air quality research on the regional scale
- ❖ Centralised data centre
- ❖ Access to world-class research infrastructures and advanced instrumentation
- ❖ Training of researchers and young scientists
- ❖ New technologies and integration tools for ground-based observations of relevant atmospheric parameters

MOTIVATION

Climate change is for a large part governed by atmospheric processes, in particular the interaction between radiation and atmospheric components (e.g. aerosols, clouds, greenhouse and trace gases).

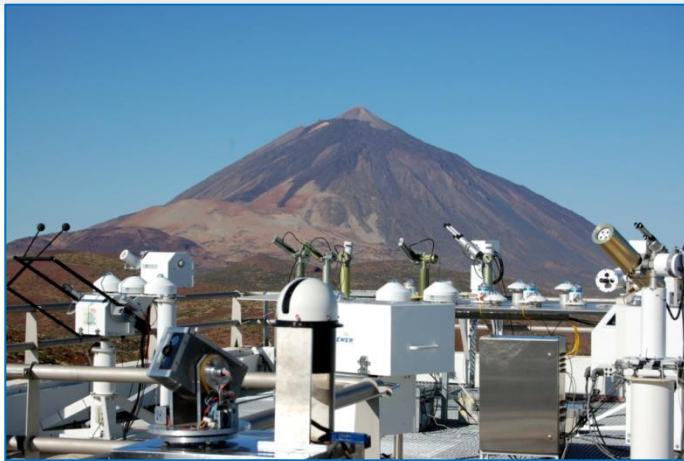
Some of these components are also those with adverse health effects influencing air quality.

Strengthening the ground-based component of the Earth Observing System for these key atmospheric variables has been unambiguously asserted in the IPCC Fourth Assessment Report and Thematic Strategy on air pollution of the EU.

However, a coordinated research infrastructure for these observations is presently lacking.

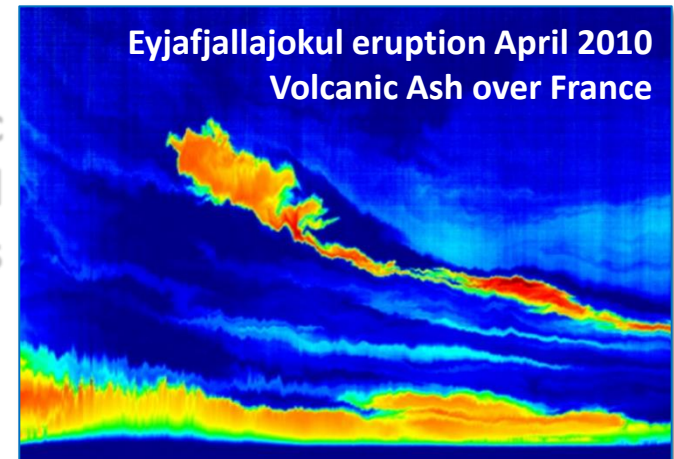
ACTRIS aims to fill this observational gap through the coordination of European ground-based network of stations equipped with advanced atmospheric probing instrumentation for aerosols, clouds and short-lived trace gases.

RATIONALE

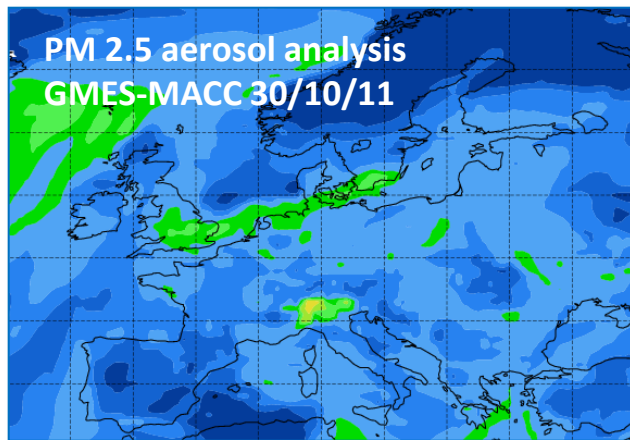


Long-term observations of key atmospheric parameters and environmental assessments related to climate, air quality, and long-range transport

Direct observation of atmospheric hazards: forest fires, dust storms and volcanic eruptions



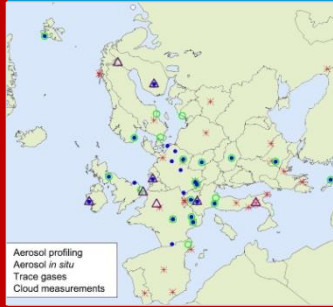
Eyjafjallajökull eruption April 2010
Volcanic Ash over France



Improved regional forecasts of both weather and air quality

Observation strategy

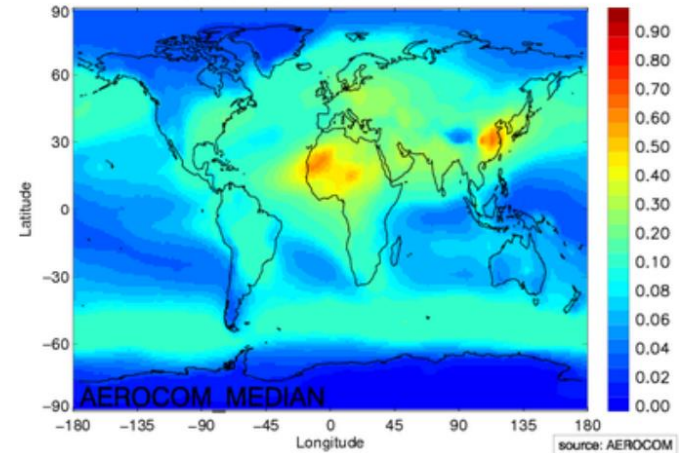
Ground-based OBSERVATIONS



- Aerosol in-situ and profiling
- Clouds profiling
- Trace gases NO_x and VOC

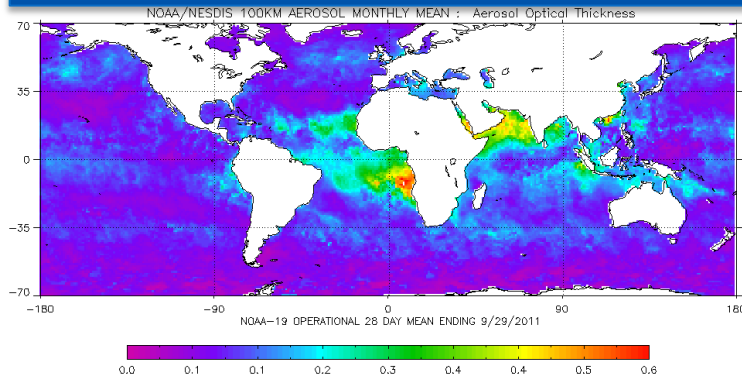
MODELLING

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Model evaluation
Data assimilation
Satellite validation

SATELLITE



MERGING EXISTING NETWORKS

Harmonized measurements
of physical, chemical and
optical aerosol properties

CREATE
FP5 -
EUSAAR
FP6

Long-range transport

Climate Change

CLOUDNET
FP5

Observation of
vertical profiles of
important cloud parameters

ACTRIS

EARLINET
FP5+6

Advanced laser remote
sensing for 4-D spatio-
temporal distribution
of aerosols

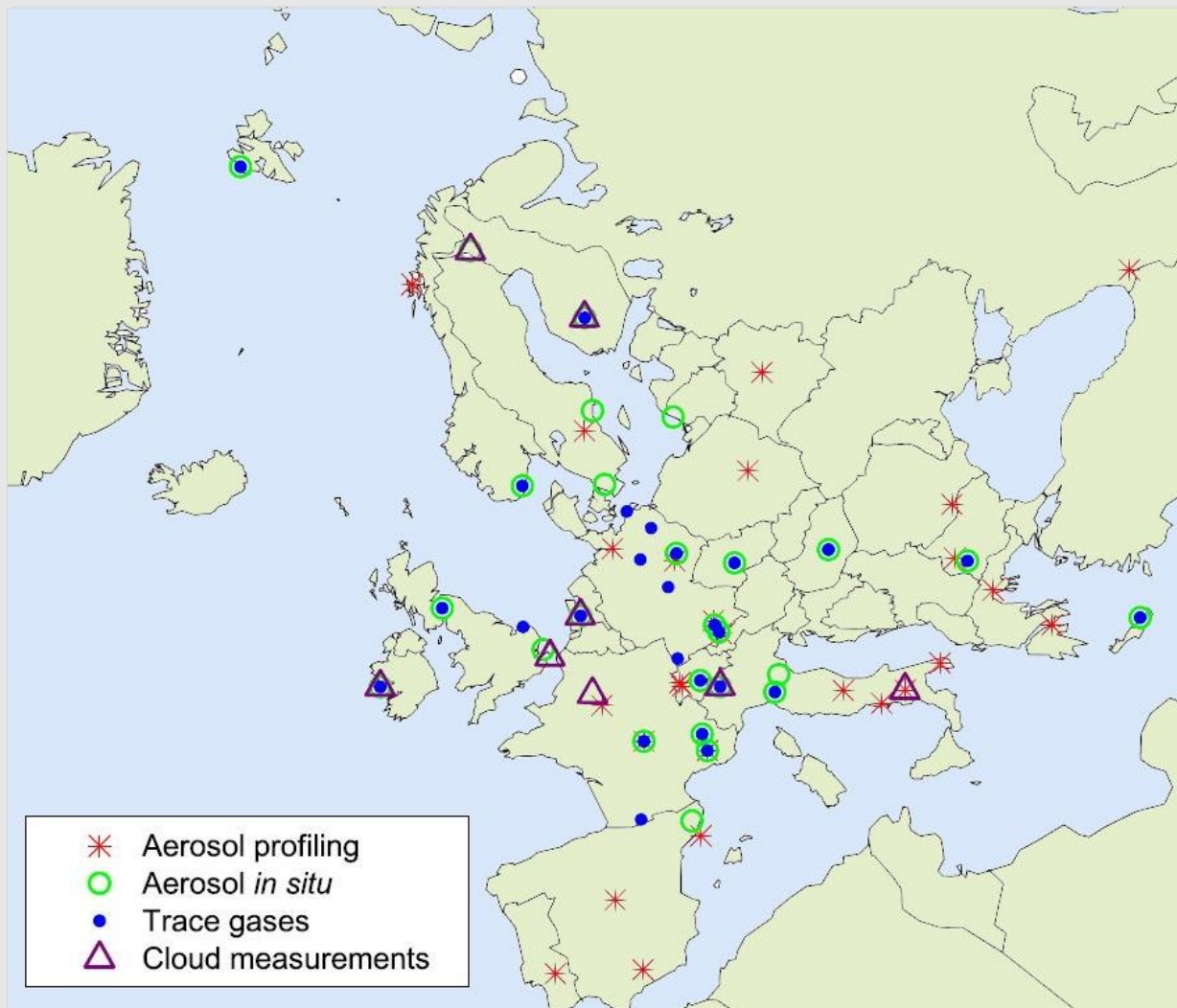
Air Quality & Health

Radiative Forcing

APRIORI

Measurement of
atmospheric precursor
compounds

Observation network



- ✓ Ground-based component of global Earth Observation System
- ✓ Provision of advanced data products and services
- ✓ Response to user needs (AEROCOM, GMES, ECMWF, research, policy-driven networks, natural hazards)
- ✓ Support policy issues on climate change, air quality, and health

High quality data

ACTRIS is a network of networks / Federation of existing networks

Each network operates with a rigorous QA program for both instrument and data processing

Observation strategy

Standardization of data and metadata

Integration is the added value

- at instrument level: exploiting the synergies among different sensors and providing integrated advanced products**
- at data base level: providing open access to a central data portal**

Data center

Centralised advanced information of key variables relevant to climate and air quality research from a multitude of representative environments and air mass types in Europe.

In addition the data center provides tools and applications for end users to facilitate the use of all measurements for broad user communities (AEROCOM, ECMWF, ...)

Harmonization with measurements of atmospheric components from other highly relevant networks and programmes at (e.g, GMES, MACC, EMEP)

Through the ACTRIS integrated data centre, more than 100 000 data sets of atmospheric parameters are expected to be available.

This is by far the most comprehensive atmospheric data centre available worldwide including in-situ aerosol and gas phase measurements, remote column aerosol observations, vertical aerosol profile information and cloud observations.

ACCESS & TRAINING RESEARCH & COLLABORATION

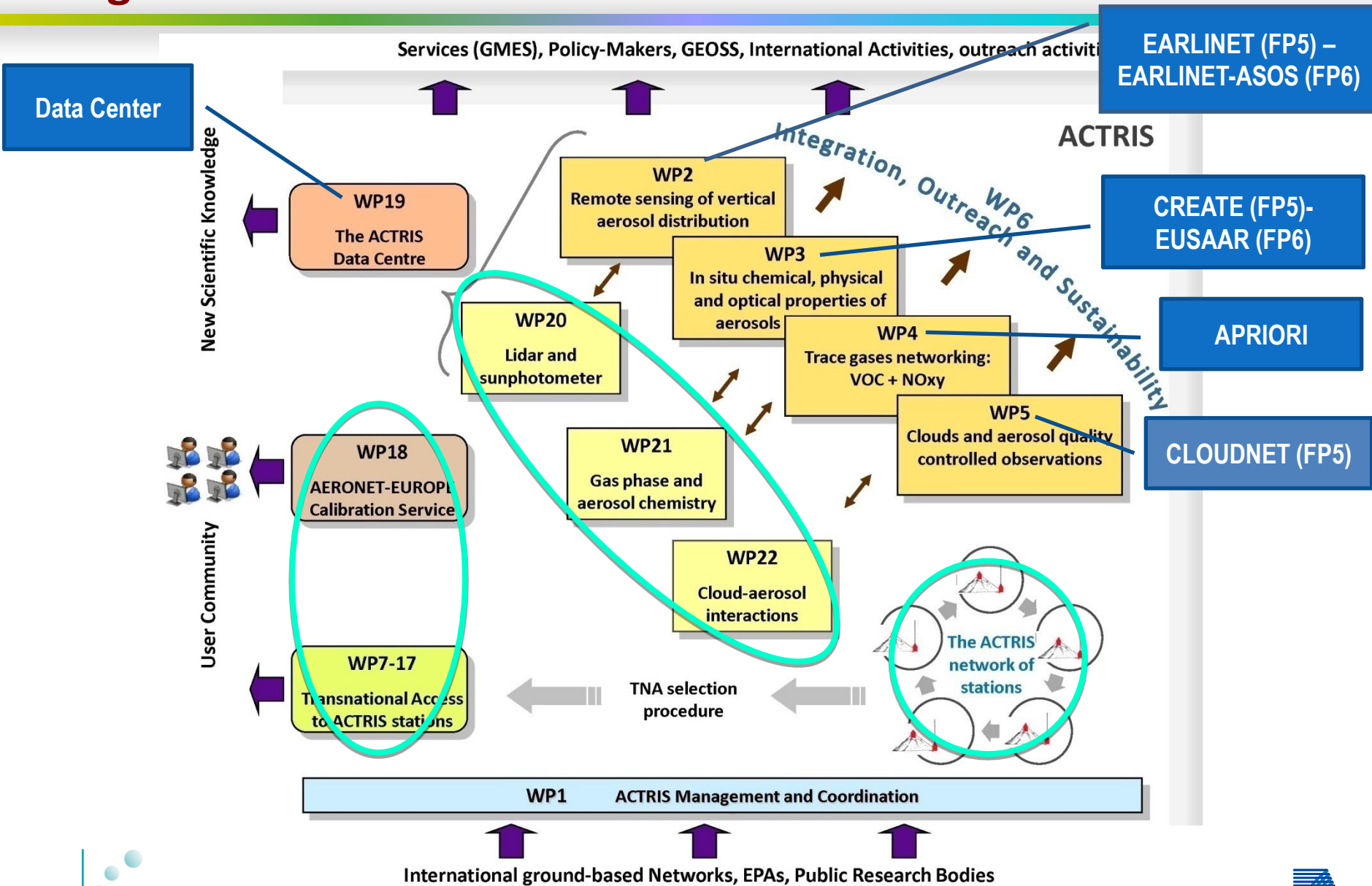


Opportunities for world-class research and international collaboration at its unique infrastructures and advanced instrumentation

Training of researchers and young scientists to become future leaders in the field and promote scientific excellence in less-favoured regions in Europe

New technologies and algorithms for monitoring activities relevant for climate and air quality models, satellite retrievals, and forecast systems.

Organization



ACTRIS contribution to AEROCOM

- Systematic/continuous measurements (including profiling)
- Specific advanced products (advanced retrievals/sensor synergies)
- Tutorials

Feedback from AEROCOM are welcome