3.1 Publishable summary

- **ICARE-2010 context and objectives**

The European Facility for Airborne Research in Environmental and Geo-sciences (EUFAR) is an Integrating Activity of the 7th EU Framework Programme. EUFAR was first constituted in 2000 (FP5), with 8 major operators of research aircraft. The follow-up FP6 project included 23 partners, operators of research aircraft, academic laboratories specializing in airborne measurements and SMEs. The FP7 EUFAR consortium has been enlarged to 33 partners by integrating infrastructures specifically dedicated to hyperspectral surface observations.
Over the past 10 years, the culture of cooperation amongst the aircraft operators has markedly evolved, and many scientific specialists in airborne research have contributed to Joint Research Activities (JRA), Expert Working Groups (EWG) and the organization of training courses. Additionally, more than 100 meetings, scientific workshops and project committees have been convened, with participants from Europe and North America. But even with all of these activities, the international airborne geo-science community at large had never had the opportunity to meet.

ICARE
International Conference on
Airborne Research for the Environment

The first International Conference on Airborne Research for the Environment (ICARE-2010) was organized in 2010 for all scientists involved in airborne research to exchange experiences and contribute to a forward-look on users' requirements and operators` development strategy, with a special focus on open access to airborne research infrastructures, joint development of a heavy payload and long endurance aircraft, availability of a stratospheric aircraft in Europe and development of UAS (Unmanned Aerial Systems) for environmental research.

This supporting activity was an exhibit of research aircraft, following the scientific conference. Decision makers could visit research aircraft from both Europe and the US, witness inter-calibration flight experiments and debate the benefits of open access and the constitution of a sustainable structure for the coordination of the European fleet.

As a result of the threats of climate change and impacts of pollution, the public is more interested in environmental research and increasingly concerned with research investments.
This Supporting Activity aimed to extend the research aircraft exhibit to the public.
The plans were designed to maximise the unique opportunity that the ICARE-2010 offered by convening the diverse communities involved in airborne research, namely the research funding institutions, the aircraft operators, the academic experts in airborne measurements, and the scientific users. All the events took place from October 25th to 31st 2010.
The International Conference was held from Monday afternoon to Thursday at the Météo-France conference centre. The aircraft exhibit was organized at the Blagnac Business airport terminal, on Friday for the institutions and professionals, and on Saturday and Sunday for the public.

LIST OF AIRCRAFT AT THE ICARE-2010 EXHIBITION

Aircraft type	***Operator***
Europe	
Falcon20	*SAFIRE (FR)*
ATR-42	*SAFIRE (FR)*
Do-228	*NERC (UK)*
CASA-212	*INTA (ES))*
Sky Arrow	*CNR (IT))*
Enduro	*Karlsruhe Univ.*
Polar5	*Wegener Institute*
Dimona	*METAIR (CH)*
Falcon20	*DLR (DE)*
USA	
C-130	*NSF*

AGENDA OF THE CONFERENCE

		Meteo-France Conference Centre									Toulouse-Blagnac Airport					
		MON 25		TUE 26		WED 27		THU 28		FRI 29		SAT 30		SUN 31		
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
EWG: Aerosol Single Scattering Albedo	09:00 - 18:00															
EWG: Instrument Integration & Certification	09:00 - 18:00															
EWG: Gas Chemistry	09:00 - 18:00															
ISPRS TOR 2.3.6.11	09:00 - 18:00															
ISPRS TOR 9	09:00 - 18:00															
Airborne (UAS) for Civil Contingencies	14:00 - 18:00/09:00 - 13:00															
EWG Book	09:00 - 18:00															
ICCAGRA Meeting	09:00 - 18:00															
COPAL Governing Board	14:00 - 19:00															
JRA2 meeting 05	09:00 - 17:00															
Emerging Technologies	09:00 - 19:00															
Stratospheric aircraft	14:30 - 18:00															
Open Access	14:00 - 18:00															
EUFAR SAC Meeting :	14:00 - 18:00															
EUFAR Mid-Term Review	18:00 - 20:00															
User Needs	09:00 - 13:00															
Open Access	14:15 - 18:15															
Forward Look	09:00 - 13:15															
ISPRS Meeting	09:00 - 12:30															

- **Work performed since the beginning of the project**

- **WP1: Overall coordination, management of the project, and reporting**.

A preliminary plan was established in January 2010 then refined with the change of location of the exhibition. Coordination meetings were organized on a monthly basis for all ICARE contributors (management, WP leaders, communication, technical staff…) and on a weekly basis for the management team to monitor the progress in the organization and to assign the following tasks to the contributors.

- **WP2**: **Conversion of the hangars to set up stands, meeting rooms, aircraft and instruments, and installation of the aircraft static exhibition on the airport tarmac.**

Meetings were organized between the ICARE team and the airport managers to visit the airport and agree on the installation. Once the layout was decided, the Météo-France launched a simplified public procurement procedure and made a call for tender for the supplier to perform the exhibition installation. Three suppliers were selected as a result of this procedure. At the end of the installation and before the opening of the exhibition, a safety inspector inspected the conformity of the whole installation.

- **WP3: Planning and management of the inter-calibration flights and interface with the regional Air Traffic Control (ATC) authorities.**

The inter-calibration flights design was completed successfully and on time. This was only possible because of the excellent cooperation provided by the Air Traffic Control authorities.
Inter-calibration flights operations were completed very successfully under extremely difficult circumstances. Most operations were completed within the allocated window but, because of a mechanical fault which grounded the NSF C-130 aircraft, the operations were extended by 3 days to allow inter-calibration with that aircraft.

- **WP4**: **Setting up of a real-time video and data link between aircraft and the airport. Installation of a large screen for the display of on-board video and real-time processed data.**

During the ICARE exhibition, large LCD screens were installed in the at the stands of SAFIRE and Météo-France and in the cafeteria area to display real-time data from the intercalibration experiment. The screens were driven by two computers (one at the SAFIRE stand, one at the Météo-France stand) which were connected by internet to the central DataTurbine server hosted at Météo-France which was configured to capture real-time data from the SAFIRE Falcon 20 and NCAR C130.

- **WP5**: **Dissemination.**

A communication plan was set up and the dissemination was preformed via different media: emails to the scientific network, advertisement on the EUFAR website and on Météo-France website, creation and distribution of ICARE leaflets and posters, call to the local press.
Two press articles were published regarding ICARE-2010 in the local press (La Dépêche):
http://www.ladepeche.fr/article/2010/11/02/939894-Blagnac-Les-avions-affinent-les-previsions-meteo.html
http://www.ladepeche.fr/article/2010/11/01/939363-Blagnac-300-specialistes-de-la-mesure-aeroportee.html

- **Final results and impact**

ICARE was the first international conference and aircraft exhibition for the European research aircraft in environmental and Geosciences. An inter-calibration experiment with so many research aircraft had not been performed before and ICARE was the first opportunity to group most of the European and US research aircraft.

Climate change and environmental pollution are headline global issues and any research in these topics tends to attract very close scrutiny from economists, policymakers, politicians and the general public. The measurements made by atmospheric research aircraft provide unique and extremely valuable data to scientists working in many diverse fields of atmospheric and earth sciences.
More specifically, significant impact is expected for:
The research funding institutions, especially those from countries with no research aircraft in geo-science. Representatives of the institutions had been advised by eminent scientists on the perspectives in airborne research, challenges and future developments. During the exhibition they discovered the range of airborne instruments and how they contribute to all fields in geo-sciences. They found quantified information on the scientific impact of the infrastructures in terms of publication in each field of science, and they learned how this is biased in each country by the type of infrastructures available.
The aircraft operators benefited, for the first time, from a unique opportunity to inter-calibrate their systems. The inter-calibration flights improve the general overall quality of airborne measurements by identifying weaknesses in procedures and instrumentation and providing improved estimates of measurement accuracy. This is a benefit with long-term effect which should improve the quality of future airborne data provided to researchers.
The ICARE-2010 was the first joint meeting of all EWG categories, hence the academic experts in airborne measurements had an ideal opportunity to exchange ideas and experiences for good practice in the organization of their expert workshops.
SMEs presented their know-how and their most sophisticated products and thus reached the largest possible collection of aircraft operators and academic laboratories involved in airborne measurements.

Finally the public, by visiting instrumented aircraft on the ground observing real research flights, better understands the rationale for the development of cutting edge research infrastructures.

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