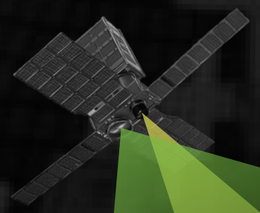


SMART AQ

SATELLITE MONITORING OF AEROSOLS FOR RELIABLE TRACKING OF AIR QUALITY

ESA ARTES4.0 BASS program for downstream applications

GRASP SAS, 7, Boulevard Louis XIV 59000 Lille, France | +33 320 436 610 | office@grasp-sas.com |

GRASP

THE PROBLEM

THE VALUE PROPOSITION

THE TECHNOLOGY

THE BUSINESS MODEL

THE MARKET

THE FINANTIALS

THE ROADMAP

THE TEAM

Adressing air pollution requires urgent global action

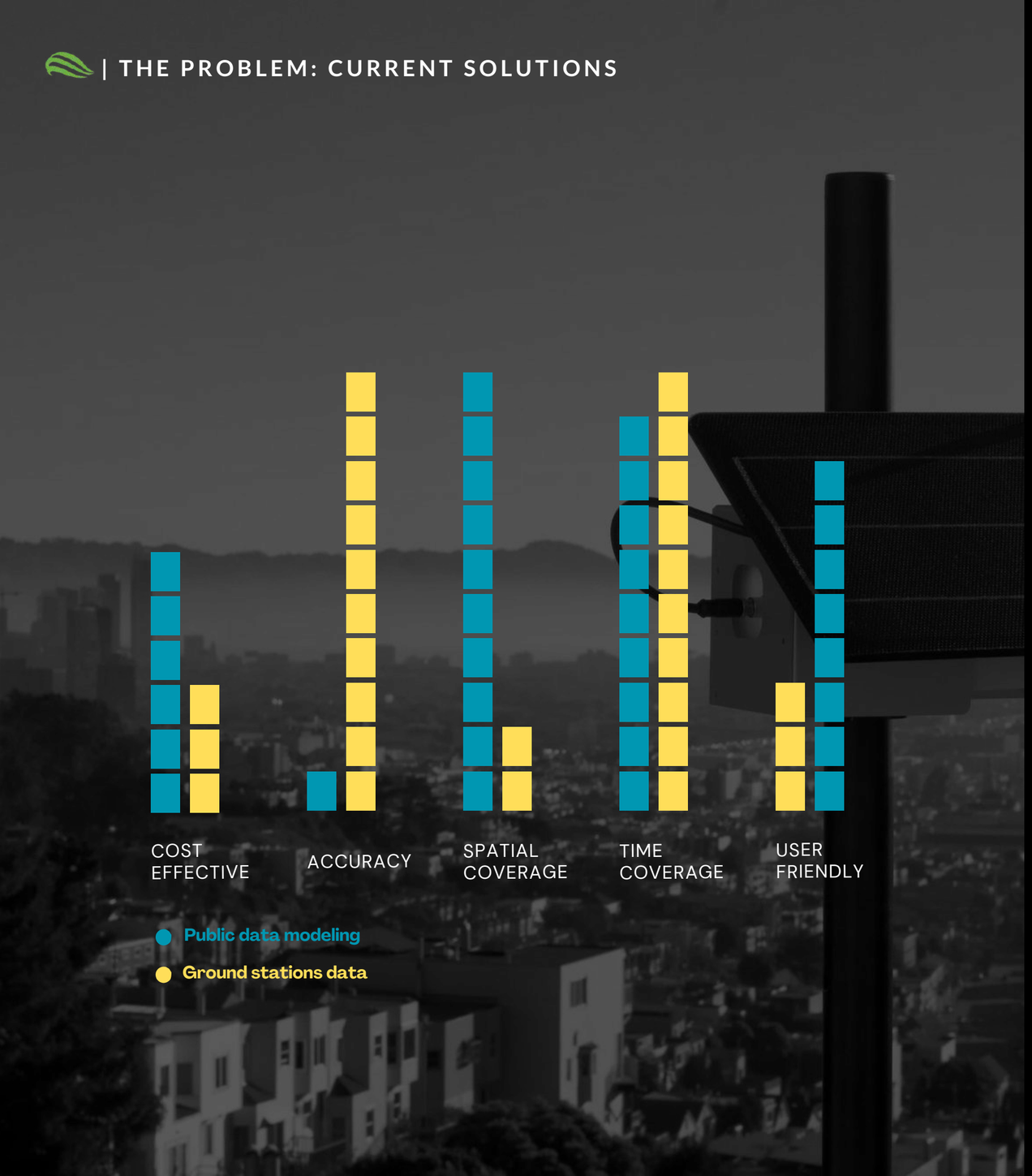
Air pollution is a major global health crisis, responsible for an estimated 7 million premature deaths each year. Despite efforts to improve air quality, only 1% of the global population lives in areas where air quality meets the World Health Organization's (WHO) guidelines (WHO guidelines, 2022). Among common pollutants, fine particulate matter (PM2.5) poses the greatest threat to human health due to its ability to penetrate deep into the lungs and bloodstream. Beyond health impacts, air pollution also carries significant economic costs—an increase of just 1 mg/m^3 in PM2.5 concentration is estimated to reduce real GDP by 0.8% annually, underscoring its far-reaching effects on both human well-being and economic productivity. Addressing air pollution requires urgent global action to meet stricter standards and reduce harmful emissions.

7M IS THE NUMBER OF ESTIMATED PREMATURE DEATHS EVERY YEAR DUE TO AIR POLLUTION

1% IS THE KNOWN PERCENTAGE OF THE GLOBAL POPULATION LIVING IN PLACES WHERE WHO GLOBAL GUIDELINES ARE MET

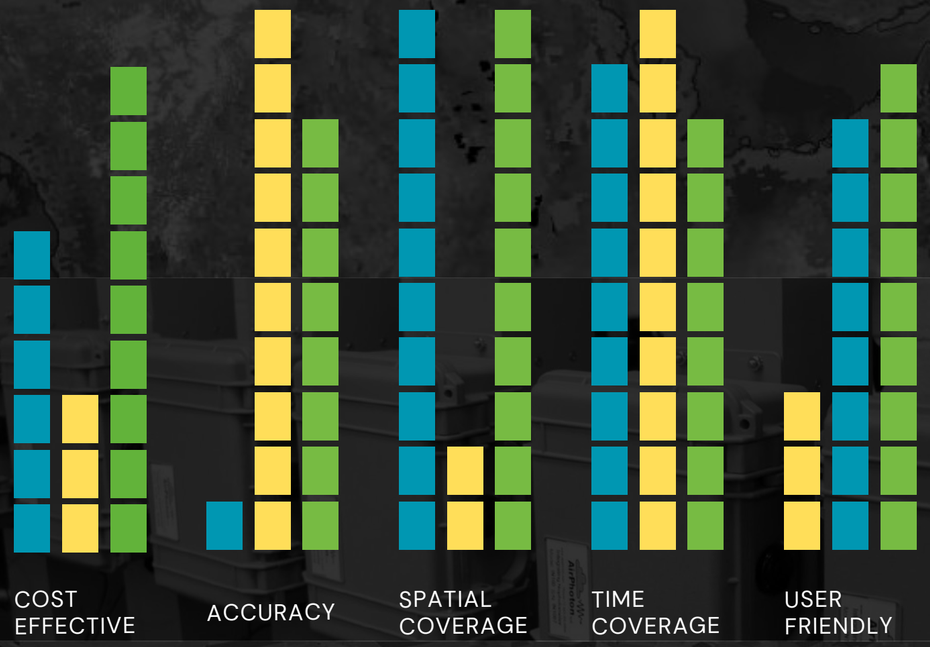
$PM^{2.5}$ IS CONSIDERED AS THE MOST HARMFUL TO HUMAN HEATLH, OUT OF THE SIX COMMON AIR POLLUTANTS

0.8% IS THE ESTIMATE REDUCTION THAT A 1MG/M3 INCREASE IN PM2.5 CONCENCTRATION CAUSES IN REAL GDP IN A YEAR



Limitations of current air quality monitoring solutions

To adress this issue, there are currently 2 methods used to monitor air quality; although they are considered as valid use, they also have some limitations. On one hand, solutions are based on assumptions: they often use generalized environmental models that may not accurately capture local air quality variations, leading to gaps in precision and localized relevance. For instance, these models could inaccurately estimate pollution levels by up to 30-50%, failing to detect small-scale yet significant emission sources. On the other hand, ground-based data are very precise for delimited areas; yet their scalability is constrained. Stations are costly and complex to deploy and mantain, leading to cove less than 5% of a city's total area, hence to significatn blind spots. For instance, in a city covering 25 km^2, a ground-based system might only monitor effectively in areas totaling 1,25 km^2, largely ignoring up to 95% of residential areas.



Combining solutions to overcome limitations

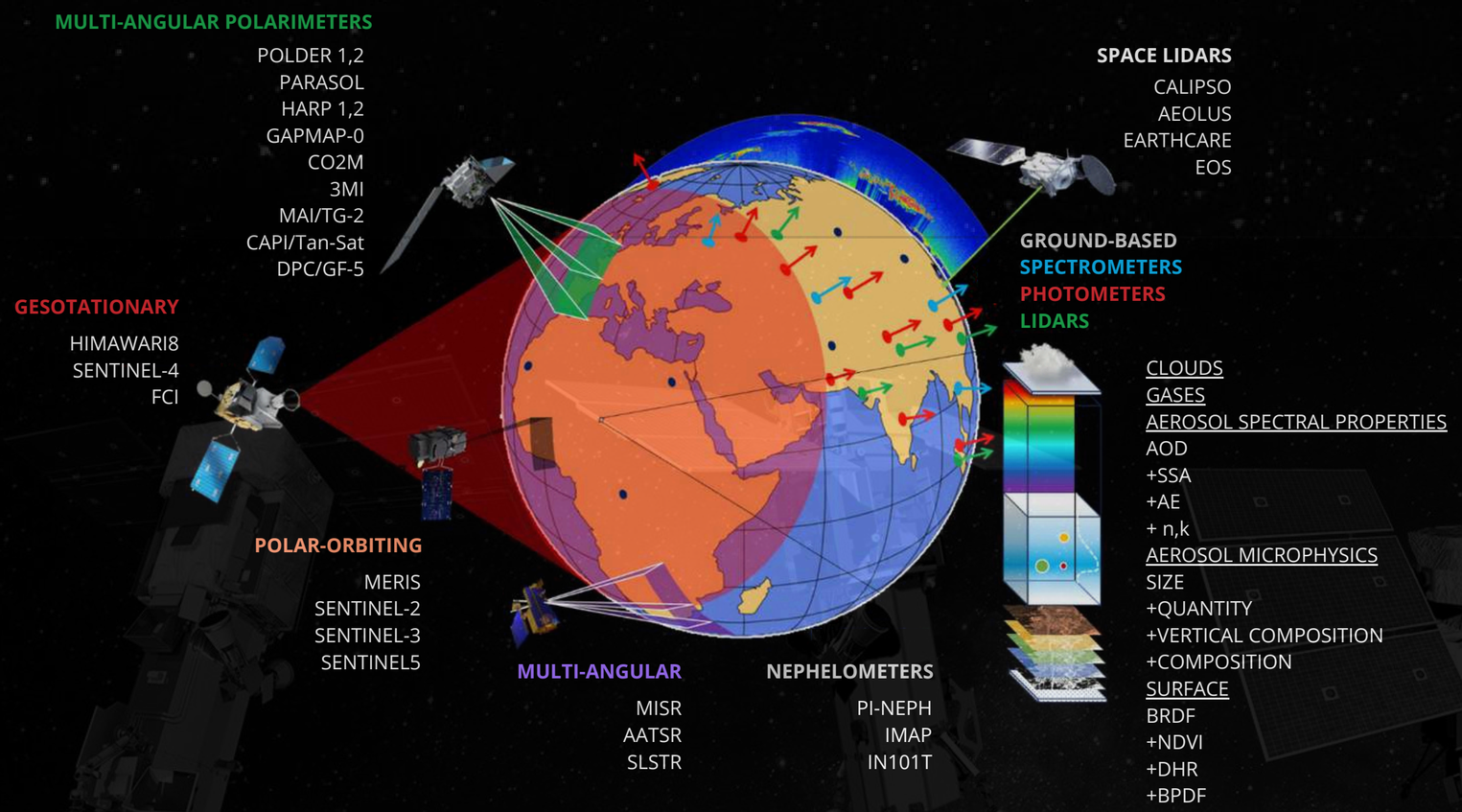
Our approach leverages over 30 years of aerosol research to create a comprehensive air quality monitoring solution. By combining satellite data from our GAPMAP constellation, ground-based instruments, and public models using the GRASP algorithm, we provide highly accurate, real-time data on PM2.5 and PM10 pollution. This integrated system addresses the limitations of traditional methods, offering broader coverage and more precise insights at lower costs. It empowers better decision-making in pollution management, helping to improve public health, reduce environmental impact, and foster economic growth through more effective air quality interventions

GRASP algorithm for atmosphere & surface retrieval

The GRASP algorithm (Generalized Retrieval of Atmosphere and Surface Properties) is an advanced retrieval algorithm designed to extract detailed information about atmospheric aerosols and surface reflectance from a variety of remote sensing data. It was originally based on the aerosol characterization algorithms used in NASA's AERONET network and has been expanded to be applicable to satellite data, ground-based observations, and other remote sensing measurements. GRASP plays a critical role in Earth observation by offering precise aerosol property retrievals, such as particle size and composition, which are typically not available from conventional satellite observations.

+80k
CITATIONS

RESEARCH SCIENCE ENGINEERING



Applications and synergies established

The GRASP algorithm integrates data from in-situ, ground-based, airborne, and satellite platforms, enhancing aerosol and surface property retrievals across various contexts. It is versatile, applied in instruments like sun-photometers and lidar on the ground, and used in airborne and satellite remote sensing. Notably, GRASP serves as the operational algorithm for key public missions such as Sentinel-4, CO2M, and 3MI, enabling advanced aerosol monitoring crucial for air quality and climate studies.

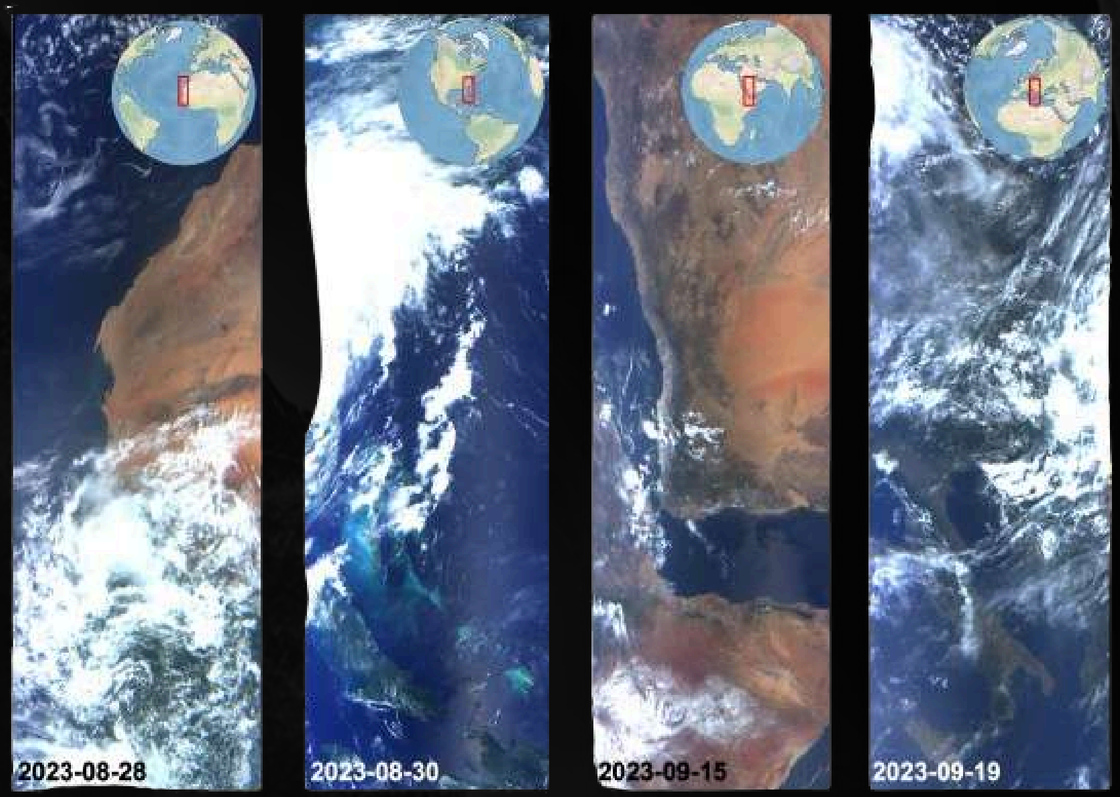


Image:GAPMAP-0’s data scenes across 4 different regions of the globe. Each scene is identified with the specific region on a map and the corresponding capture time. Source: GRASP

GAPMAP: Multi-Angular polarimetry near-real time global coverage

The GAPMAP constellation is designed to provide high-resolution, multi-angle polarimetric observations of the Earth's atmosphere, specifically focusing on aerosols. The purpose of launching the GAPMAP constellation is to merge its data with existing space-based and ground-based measurements, enhancing the quality of aerosol retrievals by leveraging a combination of diverse data sources. GAPMAP's unique multi-angle observations allow for improved characterization of particle properties like size and composition. Additionally, it aims to deliver near-real-time, global coverage, significantly increasing the temporal resolution of aerosol monitoring, with up to five observations per day over each location.

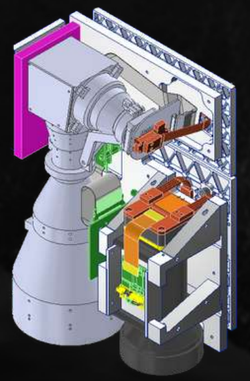
ÖWF ADLER-1-2 GAPMAP

Our Space capabilities adapted to the market needs

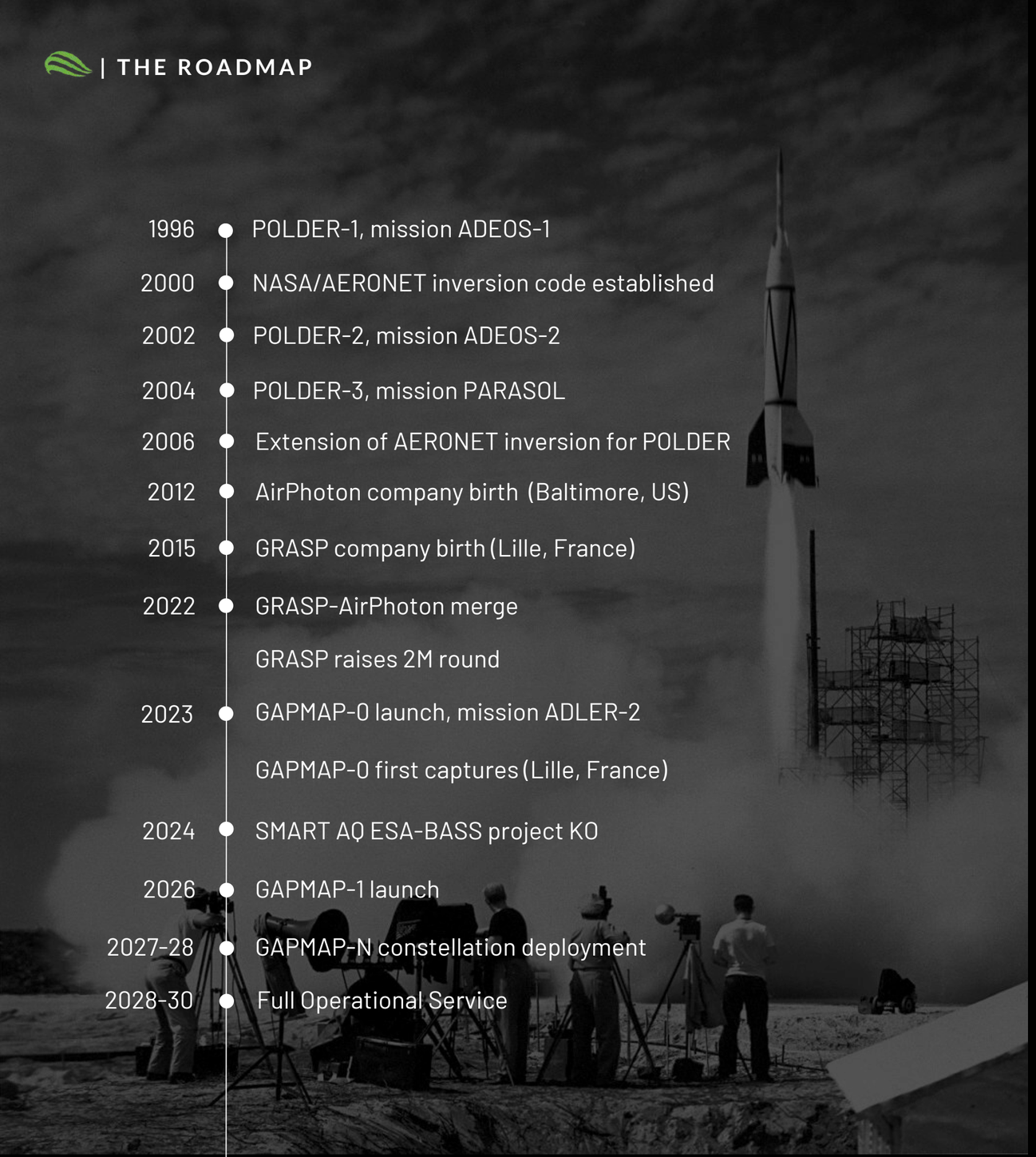
With GAPMAP IoD mission success validating our space capabilities, we are now positioned to expand beyond aerosol monitoring to address additional urgent needs, such as monitoring gas emissions, including CO2 and methane. This led us to complete the G3 prototype in early 2024, a spectrometer that can provide high-resolution, real-time data for effective gas emissions tracking. Yet, going even further, we recently developed the CLIMATE prototype, a multi-instrument payload that allows for scalable, multi-angular observations of both aerosols and gases. This innovation increases the efficiency and versatility of our satellite constellation, enabling us to serve a broader spectrum of environmental monitoring needs

Name: GAPMAP
status: testing completed
value: aerosol measurements

Name: G3
status: prototype completed
value: gas measurements



Name: CLIMATE
status: prototype completed
value: aerosol&gas measurements



1996	POLDER-1, mission ADEOS-1
2000	NASA/AERONET inversion code established
2002	POLDER-2, mission ADEOS-2
2004	POLDER-3, mission PARASOL
2006	Extension of AERONET inversion for POLDER
2012	AirPhoton company birth (Baltimore, US)
2015	GRASP company birth (Lille, France)
2022	GRASP-AirPhoton merge
	GRASP raises 2M round
2023	GAPMAP-0 launch, mission ADLER-2
	GAPMAP-0 first captures (Lille, France)
2024	SMART AQ ESA-BASS project KO
2026	GAPMAP-1 launch
2027-28	GAPMAP-N constellation deployment
2028-30	Full Operational Service

From POLDER to GAPMAP: the Roadmap of a Climate ambition

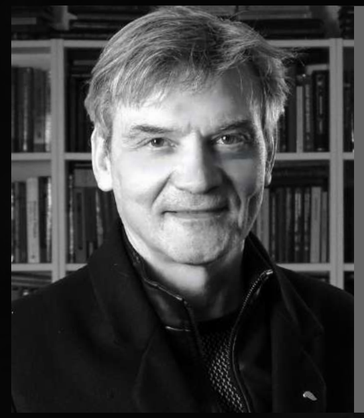
With the first images captured at the beginning of the year marking the success of our Space capabilities as well as the kick-off of our first downstream application project with ESA recently, GRASP's roadmap outlines significant developments ahead. The next steps include the launch of GAPMAP-1 in 2025, followed by the full deployment of the GAPMAP-N constellation between 2026 and 2028, providing global coverage with five daily revisits. By 2028-2030, the constellation is expected to be fully operational. In parallel, GRASP continues to enhance its Earth observation algorithms and services, integrating public satellite data with its own proprietary constellation. The SMART-AQ ESA-BASS project, launched recently, plays a key role in advancing our downstream applications, strengthening GRASP's position in the air quality monitoring sector.

GRASP EARTH

Leadership team

DAVID FUERTES
CEO

+10 years in the field of Earth Observation combining his background in computer science with Earth Observation. A versatile leader for all GRASP activities.



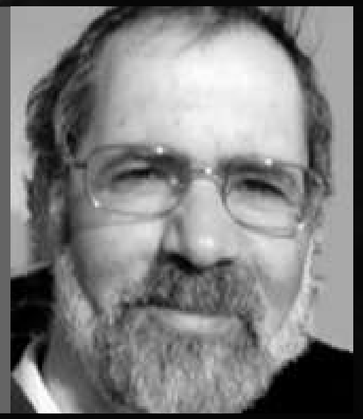
OLEG DUBOVIK
CO-FOUNDER

+ 35 years in the field of Earth Science, 10 years in NASA, 15 years as Research director in CNRS, France. #2 Top scientist in Environmental studies in France and #153 in the world by Research.com, AGU Fellow (2010), NASA Public Service Medal (2005)

PAVEL LITNINOV
CSO

+25 years in the field of Earth Science, one of top world's expert in radiative transfer. The manager and scientific leader of most research projects in GRASP.

Co-developed NASA's international training program. With +30 years of experience in teaching, training, and communicating science and technology, he also boasts 25 years in algorithm development for satellite retrievals.



RICHARD KLEIDMAN
COO

+30 years of experience in developing scientific instrumentation for remote sensing.

Director of the Earth Space Institute at UMBC.

VANDERLEI MARTINS
CTO

+30 years in leading large scientific groups. AGU Fellow (2015), Committee member of National Climate Change Science Program and the United Nation's working group on Hemispheric Transport of Air Pollution.

LORRAINE REMER
CSO

MEET GRASP AT

Pollutec 2025

MONITOR

Discover the first PM2.5-10 monitoring tool made from satellite data and 30 years of scientific developments

OBSERVATIONS

UNDERSTAND

Discover real PM emissions over your facilities and beyond – including transboundary impacts.

INSIGHTS

ACT

From OPEx to ESG, discover how your organization can benefit from this world's first scientific advancement

DECISIONS

BOOK A 5MIN DEMO AND GET A FREE SAMPLE OVER YOUR AREA OF INTEREST AND TIME FRAME

GRASP SAS, 7, Boulevard Louis XIV, 59000 Lille, France
+33 320 436 610 | office@grasp-earth.com

www.grasp-earth-com