IAGOS

IN-SERVICE AIRCRAFT FOR A GLOBAL OBSERVING SYSTEM

Introduction to IAGOS

JÜLICH Forschungszentrum · cnrs · KIT Karlsruhe Institute of Technology · DLR · METEO FRANCE · MANCHESTER 1824 · TROPOS

What is IAGOS?

Monitoring climate and air quality using commercial aircraft

6 AIRLINES

8 AIRCRAFT
Airbus A330/A340

8 RESEARCH INSTITUTES

26 YEARS
of data since 1994

330 VISITED AIRPORTS

400 PEER REVIEWED PUBLICATIONS

2 METHODS

100 Atmospheric Components
1 Aircraft, 4 flights per month

6 Essential Climate Variables
7 Aircraft, daily flights

60,000 FLIGHTS

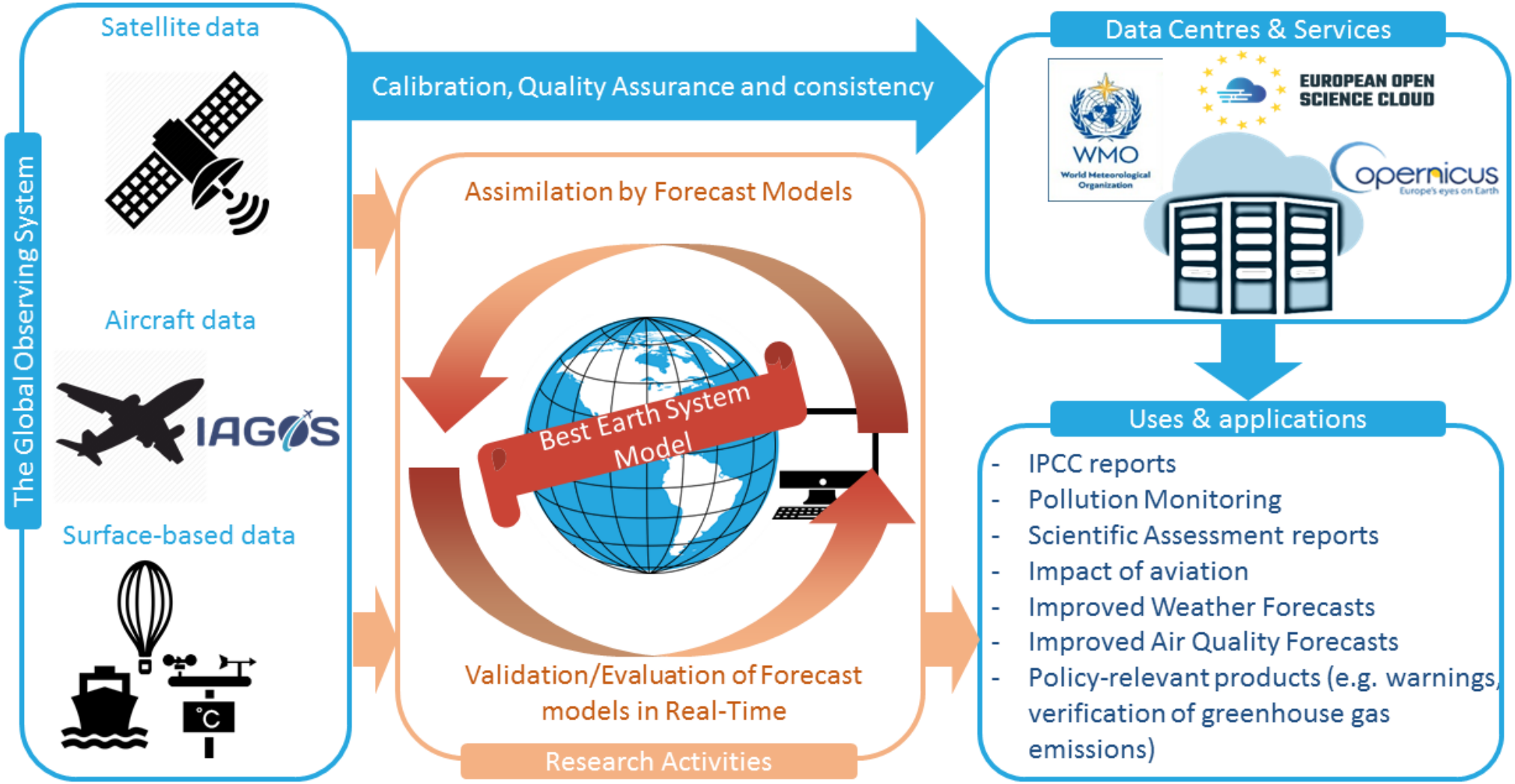
How does IAGOS work?

- Permanent installation of instruments in the avionics bay of Airbus A330/A340
- Continuous operation with 500 flights per aircraft per year
- Regular global-scale in-situ monitoring of atmospheric composition (ozone, water vapour, greenhouse gases, reactive gases, aerosols, clouds)

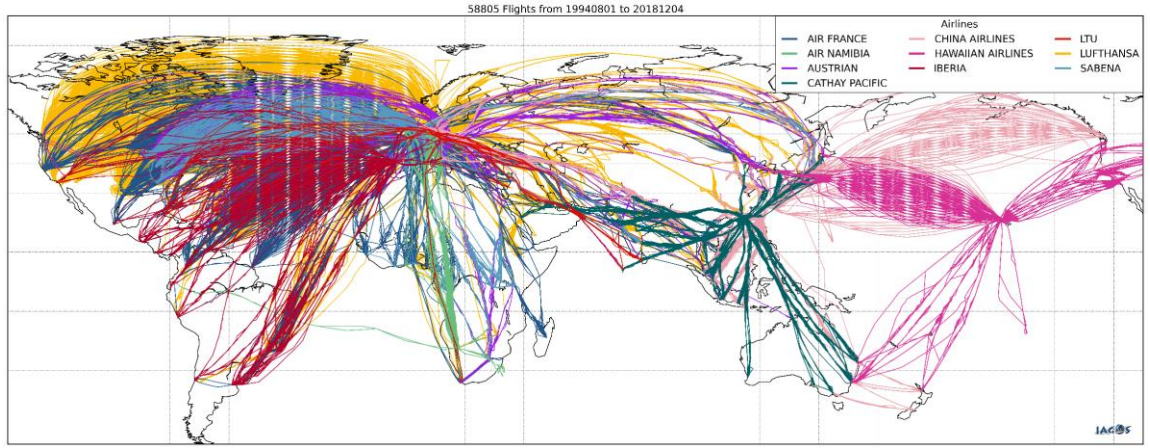
- Cargo container with 19 instruments
- Flies twice a month 50 flights per year
- Detailed processes around the tropopause

Global Observing Strategy

The role of IAGOS in the development of an Integrated Global Observing Strategy

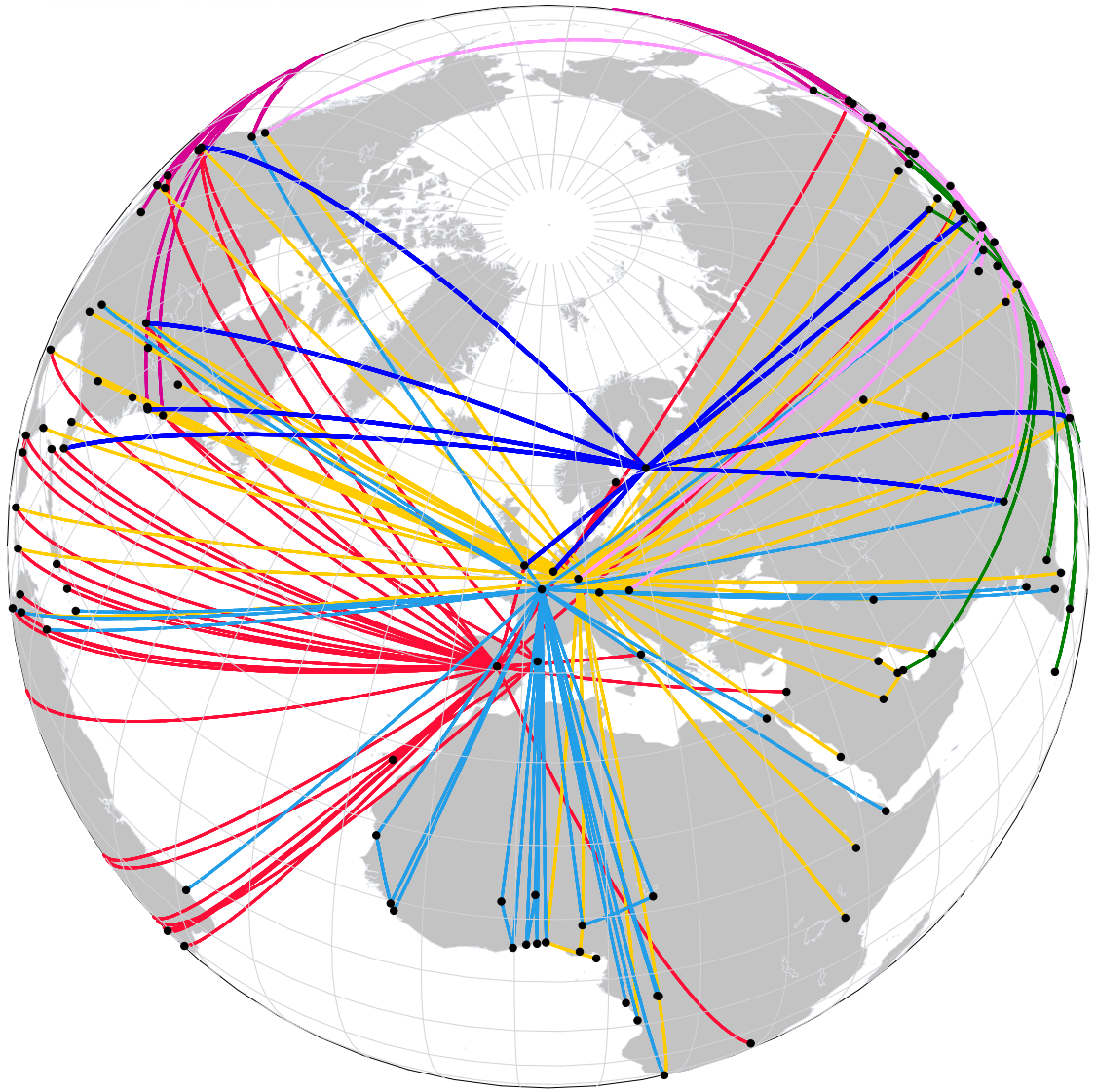


Fleet



Lufthansa AIRFRANCE CHINA AIRLINES CATHAY PACIFIC IBERIA HAWAIIAN AIRLINES

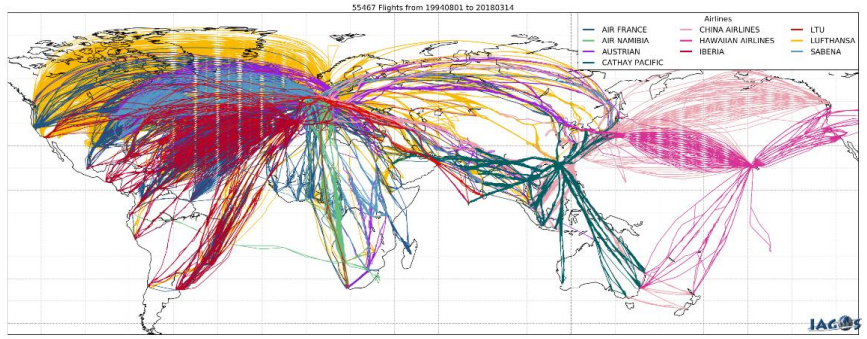
Bridging the Arctic data-gap



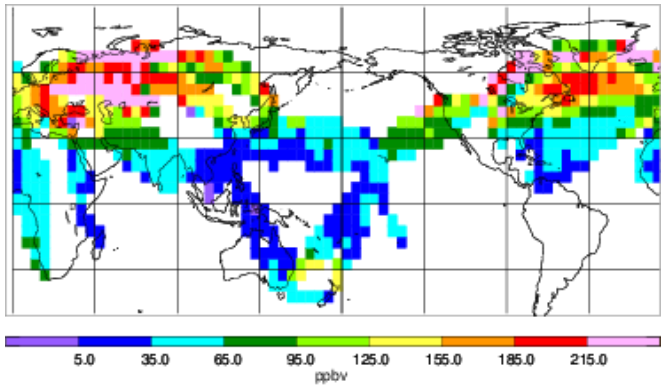
FINNAIR

IAGOS Measurements

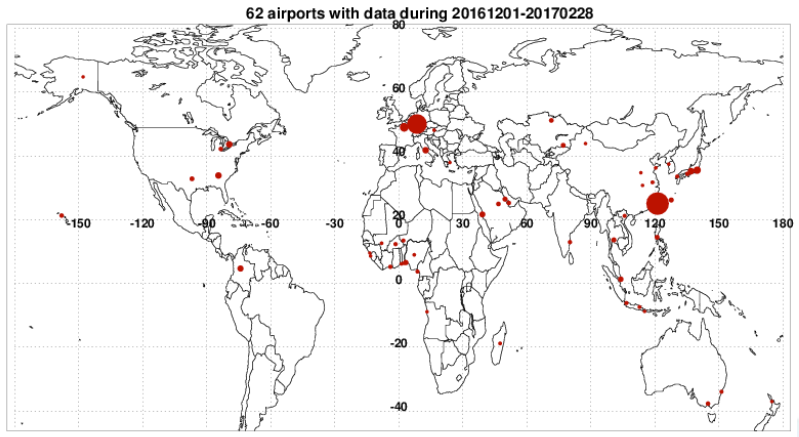
Cruise Altitude



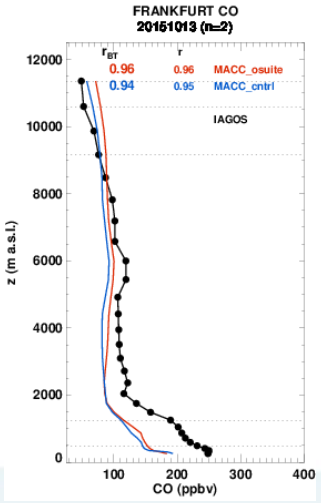
Climatologies and trends in UTLS

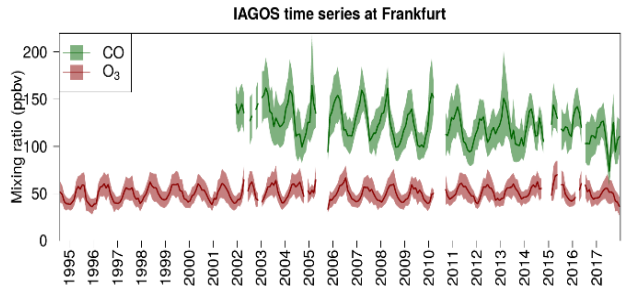


Landing-Take-off Profiles



Vertical Profiles for Air Quality studies



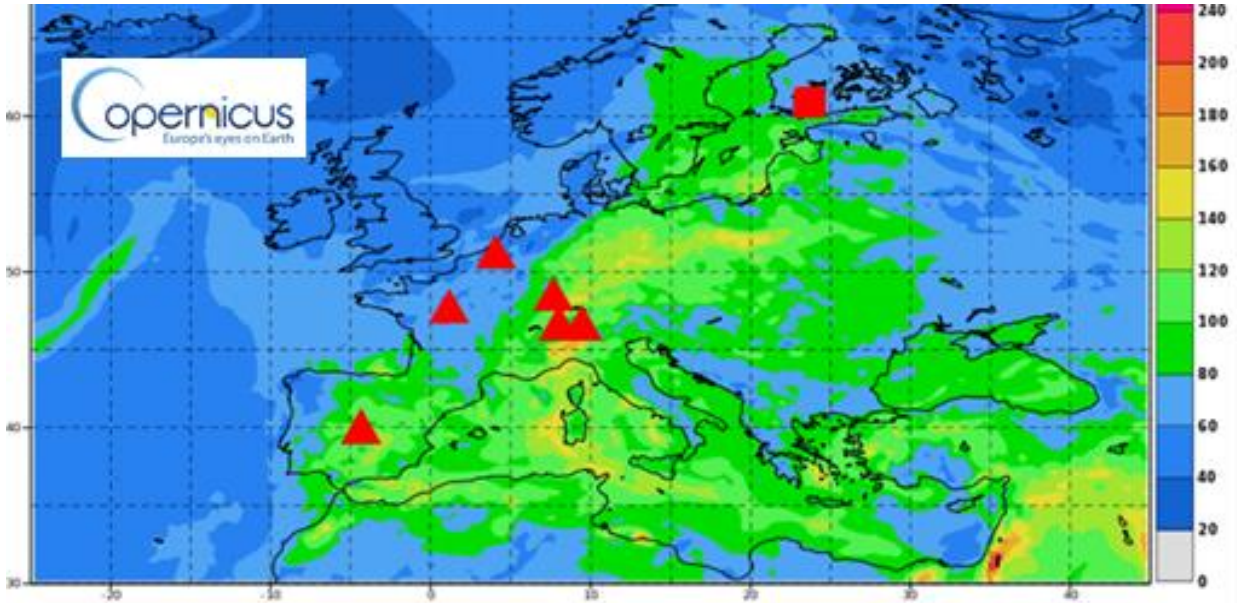


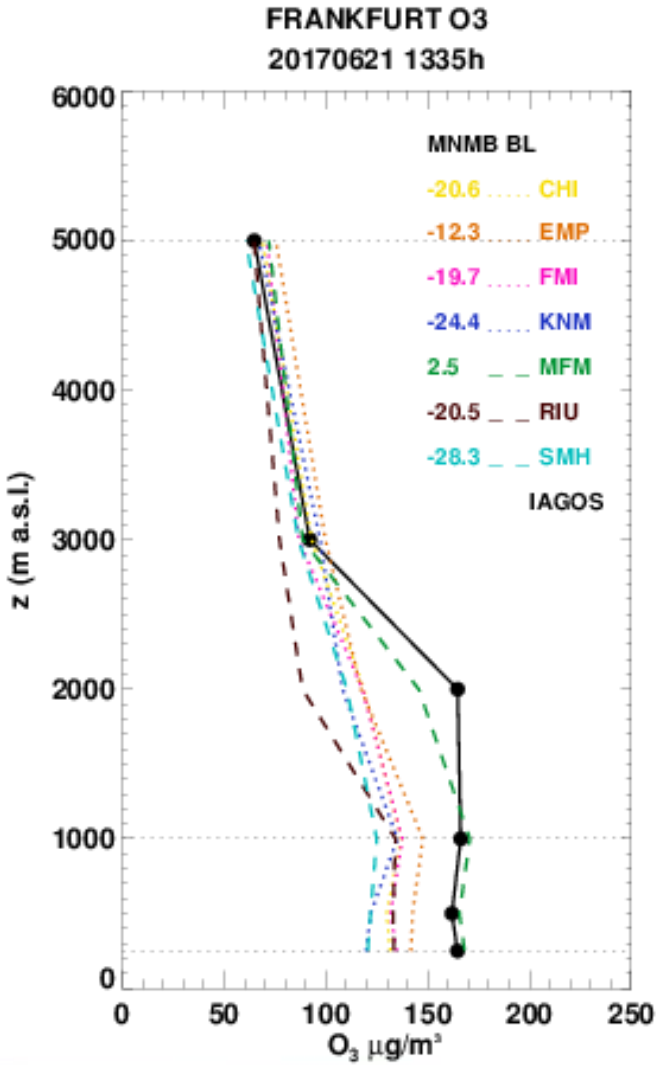
Air Quality in Northern Cities

Regularly Visited European Airports:
Paris, Frankfurt, Amsterdam, Vienna

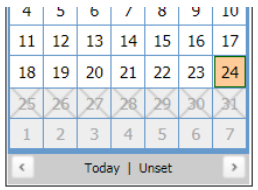
http://www.iagos.fr/cams/region_day_profiles_models.php

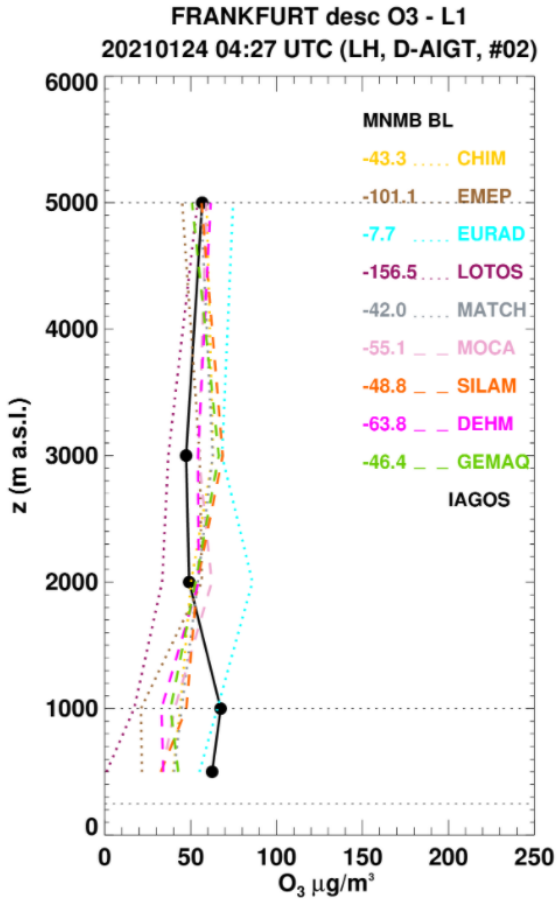
9 regional models and Ensemble:
CHIMERE (INERIS), EMEP (MetNO), EURAD (Uni Cologne), LOTOS_EUROS (KNMI), MATCH (Sweden), MOCAGE (MF), SILAM (FMI), DEHM (Denmark), GEMAQ

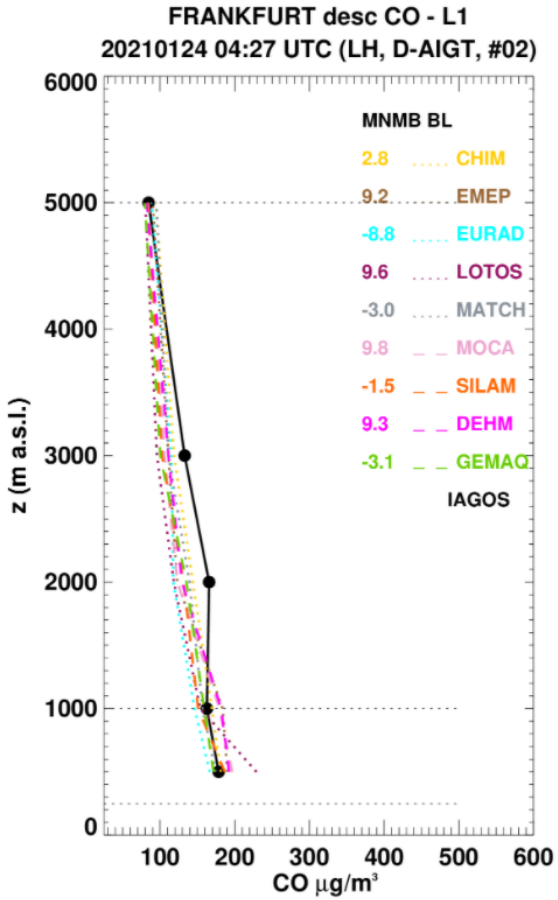




Air Quality Monitoring - CAMS







Atmosphere Monitoring

- Profiles of the day - O3 and CO
- Profiles of the day - H2O
- Daily profiles - O3 and CO
- Daily profiles - H2O
- Monthly mean profiles
- Three monthly time series

Evaluation of the global re-analysis CAMS

- Profiles of the day
- Daily profiles
- Time-height sections
- Time-height section scores

Evaluation of the global re-analysis MACC

Vertical profiles

- IAGOS-core
- IAGOS-CARIBIC

UTLS Distribution

- O3
- CO
- Model - Observations

Seasonal Climatologies in the UTLS

Evaluation of the regional models

European Profiles of the day

Monitoring Arctic Wildfires

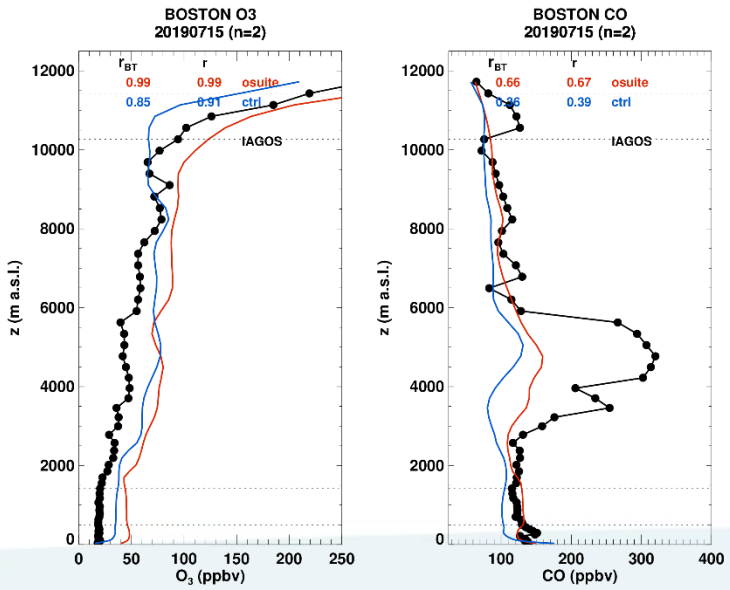
NEWS ► CAMS MONITORS UNPRECEDENTED WILDFIRES IN THE ARCTIC

CAMS monitors unprecedented wildfires in the Arctic

DATE: 11th July 2019

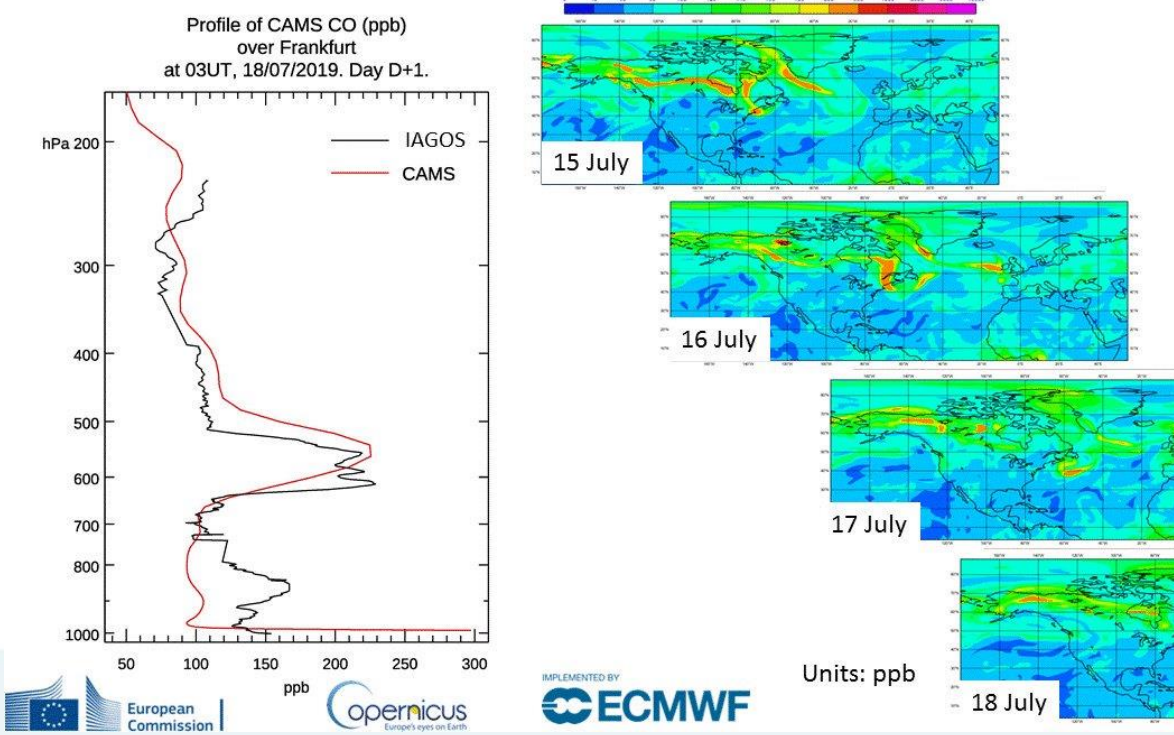
Over the last six weeks, the Copernicus Atmosphere Monitoring Service (CAMS) has tracked over 100 intense and long-lived wildfires in the Arctic Circle. In June alone, these fires emitted 50 megatonnes of carbon dioxide into the atmosphere, which is equivalent to Sweden's total annual emissions. This is more than was released by Arctic fires in the same month between 2010 and 2018 put together.

Although wildfires are common in the northern hemisphere between May and October, the latitude and intensity of these fires, as well as the length of time that they have been burning for, has been particularly unusual. CAMS, which is implemented by the European Centre for Medium-Range Weather Forecasts (ECMWF) on behalf of the EU, incorporates observations of wildfires from the MODIS instruments on NASA's Terra and Aqua satellites into its Global Fire Assimilation System (GFAS) to monitor the fires and estimate the emission of pollutants from them.



'Unprecedented': more than 100 Arctic wildfires burn in worst ever season

CO transport form North American fires in July 2019



Summary

- Flights over Siberia are expected to provide important data on CH_4 and CO_2 emissions from Siberian tundra as predicted in a warming climate, these data can be linked to coordinated ground-based observations along the Arctic circle by inverse modelling.
- Regular vertical profiles over Nordic capitals would serve as first climatology of trace species and air quality parameters at high latitudes (60 °N) and offer direct validation for SILAM (Finland) ,MATCH (Sweden), DEHM (Denmark), EMEP (Norway), air quality models.
- Daily vertical profiles of measured parameters for Nordic capitals
- Better tracking of fire plumes across Atlantic from boreal fires
- Stratosphere-troposphere exchange along polar jet

Connect with us!

www.iagos.org

IAGOS_RI

@IAGOS_RI

Atmosphere Monitoring Service

www.iagos.fr/cams

IAGOS_RI

IAGOS

IN-SERVICE AIRCRAFT FOR A GLOBAL OBSERVING SYSTEM

Get in touch

www.iagos.org

@IAGOS_RI