

ICAO Aviation Green Recovery Seminar

TIME TO BUILD BACK BETTER





Climate observation and knowledge through the use of civil aviation aircraft

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About WMO

As a specialized agency of the United Nations, WMO is dedicated to international cooperation and coordination on the state and behaviour of the Earth's atmosphere, its interaction with the land and oceans, the weather and climate it produces, and the resulting distribution of water resources.



Applications Services – for public & private sectors in weather, agriculture, transport, disaster recovery & risk management



Capacity Development – for our 193 members in 6 regions



Exchange of data, information, products & services



Observations programs supporting applications for weather, hydrology & climate

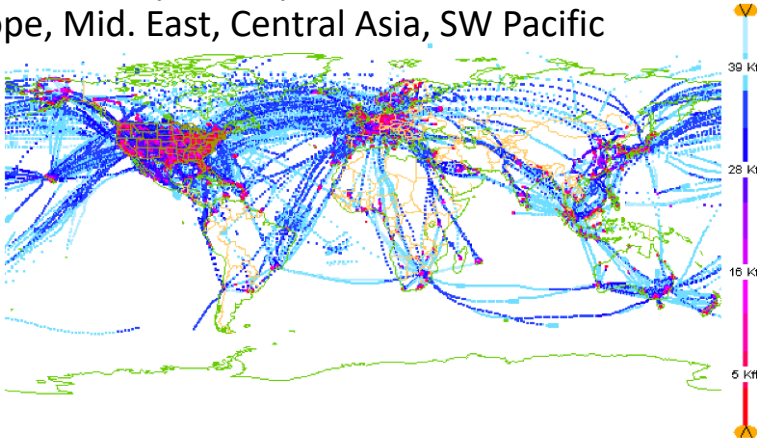


Coordination of research programs to advance technical capabilities



WMO Aircraft Meteorological Data Relay (AMDAR) & Collaboration with IATA

- AMDAR is PPP between government MET services & partner airlines circ. 1980s
- Currently
 - 12 national/regional programmes
 - 43 airlines
 - > 4000 aircraft
 - > 700K obs. per day (pre-COVID, cf 350K currently)
- However many data-sparse areas: Africa, Sth America, Eastern Europe, Mid. East, Central Asia, SW Pacific



31-Jan-2020 00:00:00 – 31-Jan-2020 23:59:58 (872710 obs loaded, 728535 in range, 24197 shown)



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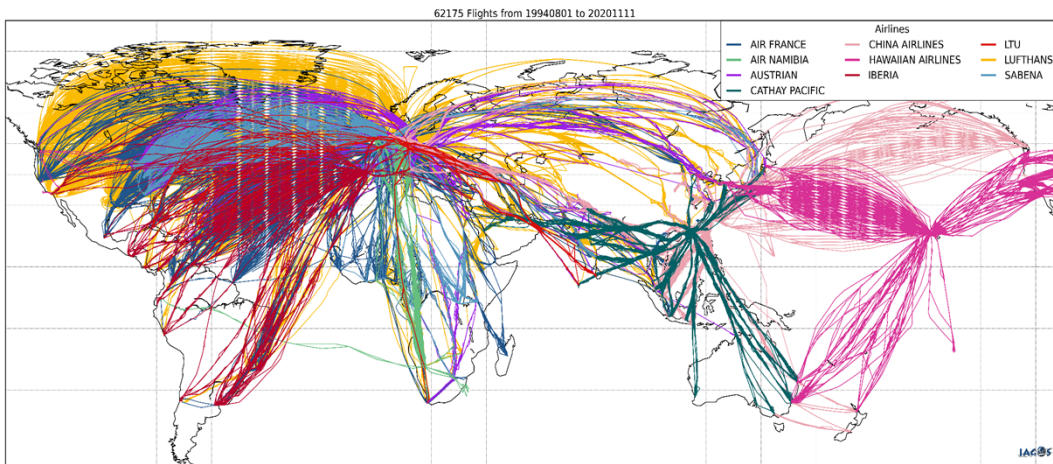


Role of IATA	Role of WMO	Benefits
<ul style="list-style-type: none"> • business case for airline participation • efficient solutions for onboard processing & downlink 	<ul style="list-style-type: none"> • Receive, process & distribute data to users • provide improved service & products for aviation 	<ul style="list-style-type: none"> • Expanded global coverage • Regionally-based collaborative programs • Standardised data policy • Standardised technical solutions



The In-service Aircraft for a Global Observing System (IAGOS)

- IAGOS uses commercial passenger aircraft as a platform for the measurement of the composition of the atmosphere.
 - 11 commercial aircraft from six airlines
 - vertical profiles, & wider upper-air coverage en route
- IAGOS contributes to WMO Global Atmosphere Watch's (GAW) as complement to GAW's atmospheric composition surface observations.
- Combines the expertise of scientific institutions with the infrastructure of civil aviation to provide essential data on climate change and air quality at a global scale.
- Provides valuable information on aviation's greenhouse gas emission (H₂O, CO₂, N₂O, CH₄).



Greenhouse gases	MOZAIC	IAGOS- CORE	IAGOS-CARIBIC
H ₂ O	X Since 1994	X Since 2011	X Since 1997
CO ₂		X Since 2018	X Since 2005
N ₂ O			X
CH ₄		X Since 2018	X Since 1995



Benefits to Aviation & Green Recovery



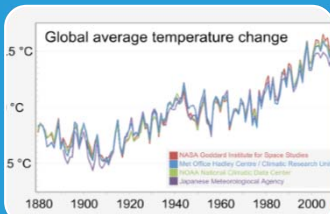
In-situ measurement of key weather variables

- Improved & more accurate weather information for applications & services
 - Impacts of weather reduced
 - less & reduced length of delays
 - Input to optimal flight planning
 - Input to airspace & arrival management
- **Reduced global aviation fuel consumption**



In situ measurement of atmospheric composition

- Long-term, frequent, regular, accurate in-situ atmospheric observations
 - Measurements of a suite of GHG in the upper-troposphere/ lower-stratosphere
- **Accurate estimation of GHG emission impacts by aviation**



Input to climate research & applications impacting aviation

- Optimal flight planning & airspace use
- Aviation infrastructure future planning
- Changing climate and weather impacting aviation
- Reduction of aviation impacts, e.g. contrail production



Thank you

More information:

- AMDAR: <https://community.wmo.int/wmo-amdar-observing-system>
- WICAP: <https://community.wmo.int/activity-areas/wmo-iata-collaborative-amdar-programme>
- IAGOS: <https://www.iagos.org>
- Japan Contrail program:
<http://www.cger.nies.go.jp/contrail/index.html>
- WMO: <https://public.wmo.int>

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