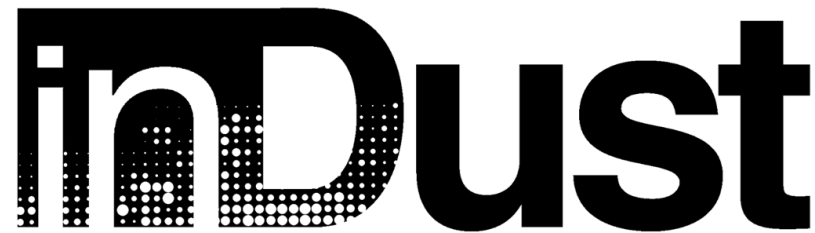


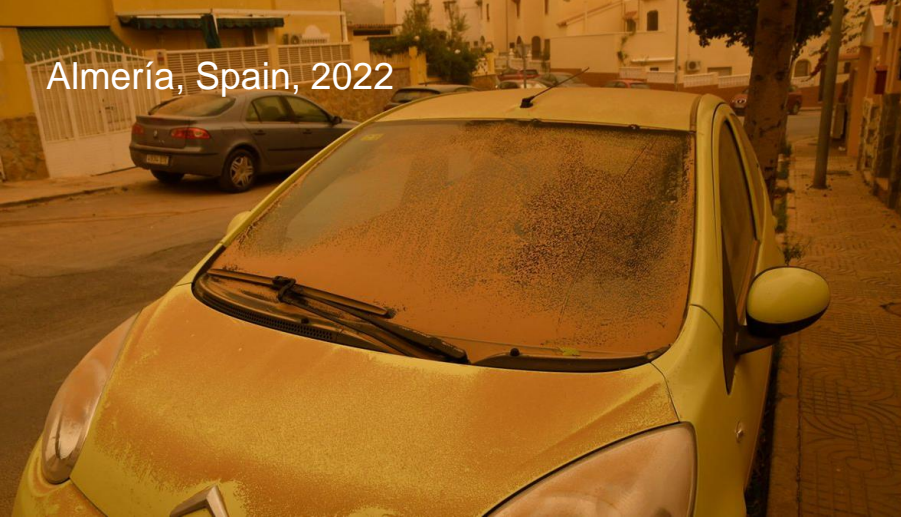
# International Network to Encourage the Use of Monitoring and Forecasting Dust Products



*COST Action CA16202*

Sara Basart ([sbasart@wmo.int](mailto:sbasart@wmo.int), Switzerland, WMO)  
on behalf of the inDust network

Almería, Spain, 2022



Switzerland, 2022



Crete, 2018



12:00h



15:00h



17:30h



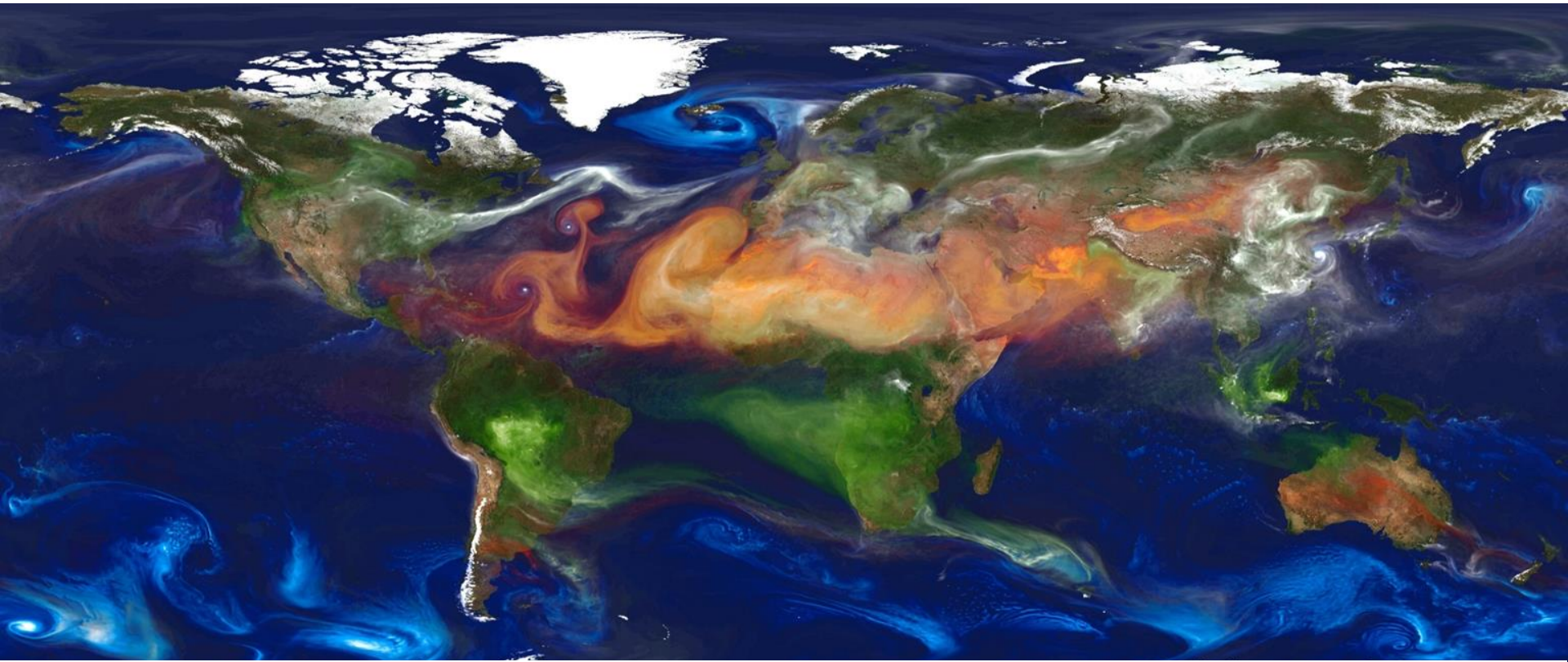
Tenerife 2020

Paris, 2021





# Sand and Dust Storms



Organic Carbon + Elemental carbon

Dust

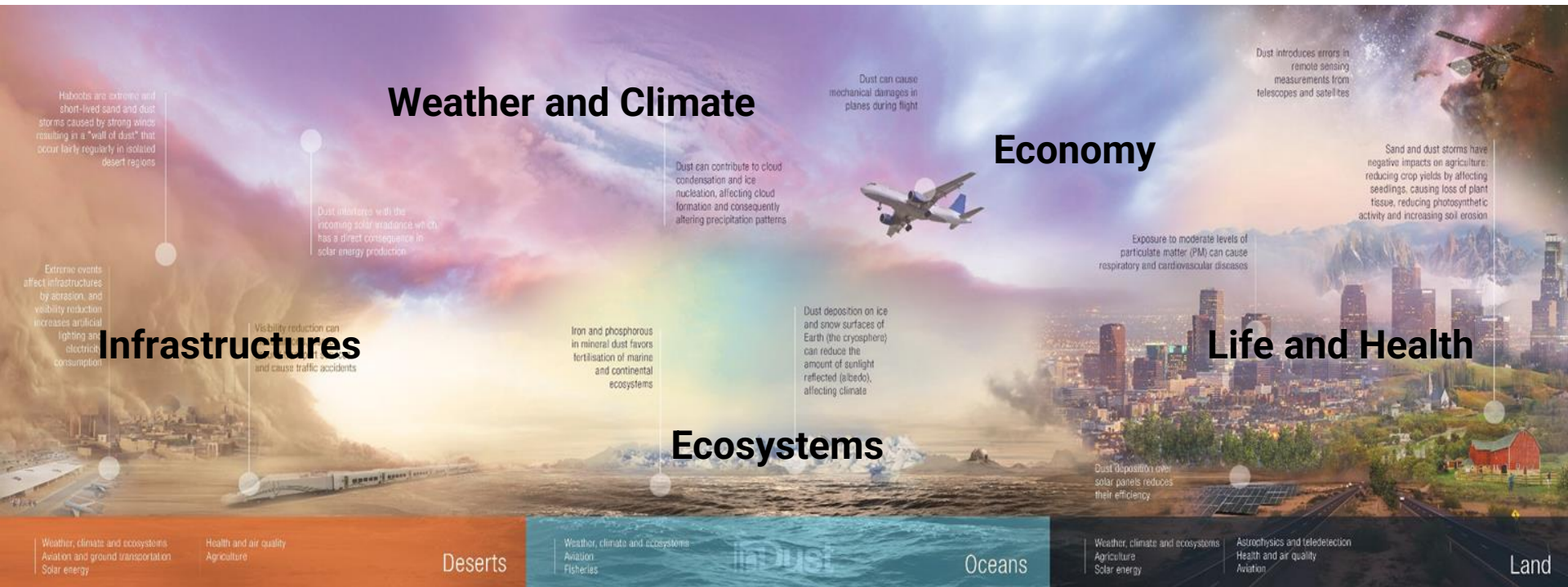
Sulfate

Sea salt

NASA | GEOS-5 Aerosols

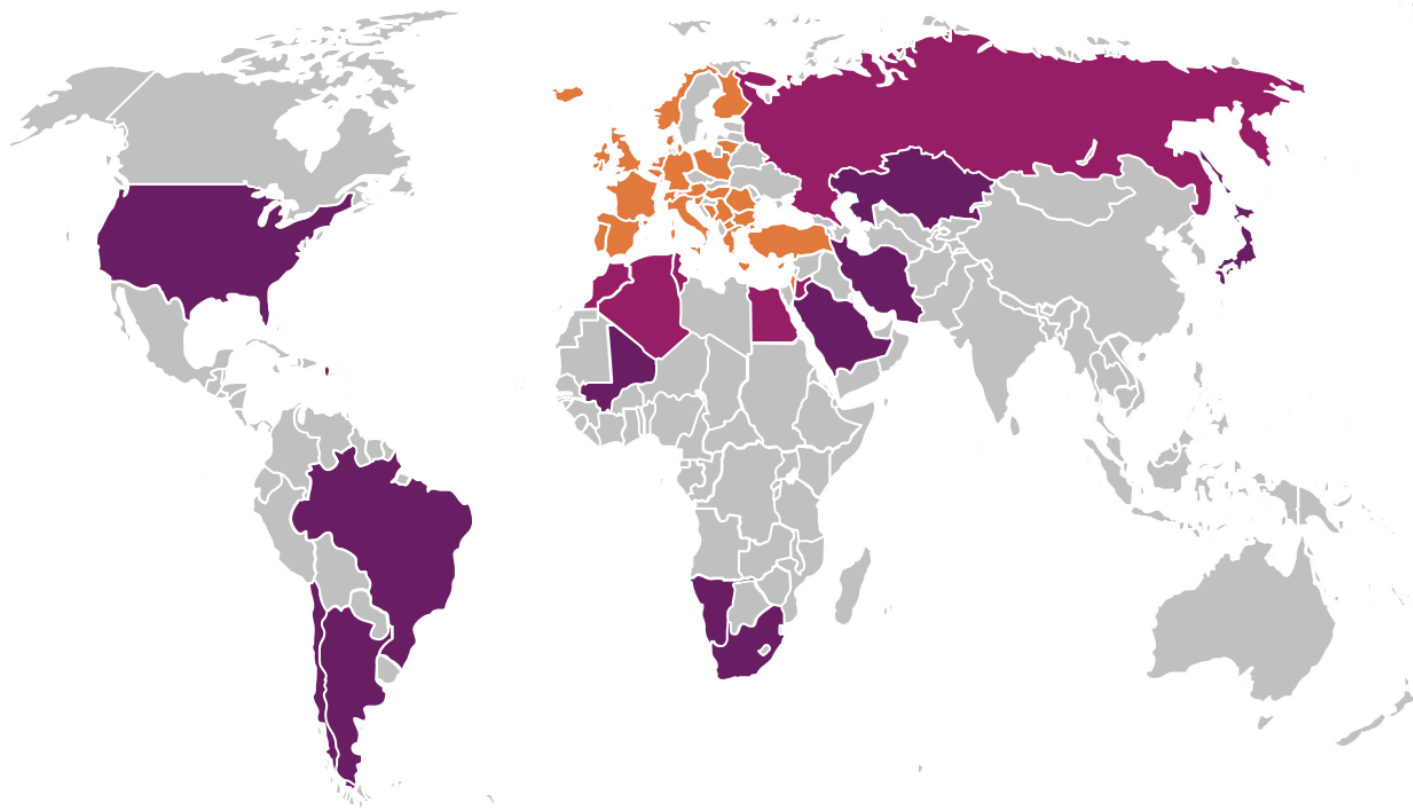
# Our Objective

To understand the user's needs in risky sand and dust storm environments for the development of tailored products



*inDust Leaflet available in [www.cost-indust.eu/media-room](http://www.cost-indust.eu/media-room)*

## The network extension



- COST countries (29 countries)
  - Near-Neighbour Countries (Algeria, Egypt, Jordan, Lebanon, Morocco, Tunisia and Russia)
  - International Partner Countries
- International Organisations (WMO, ECMWF, WHO)

**more than 300 participants around the world  
from more than 25 different disciplines**



# USER ENGAGEMENT: Why?

We **need** potential users to enroll them into the process of the **design** of the tailored product.



**Users** will help on the identification of **impacts** and in ideas for **risk mitigation**.  
**This means that we need to understand their needs.**

# USER ENGAGEMENT: How?

We **need** to create **interest** in the topic

## WORKSHOPS AND MEETINGS

User Workshop on Solar Energy - Soiling (DE)



WG on Modelling Activities (RS)



Meeting on Dataviz and Communication (RO)



User Workshop on products for Aviation (UK)



User Workshop on products for Air Quality (IT)



User Workshop on products for Solar (DE)



Workshop on High Latitude Dust (IS)



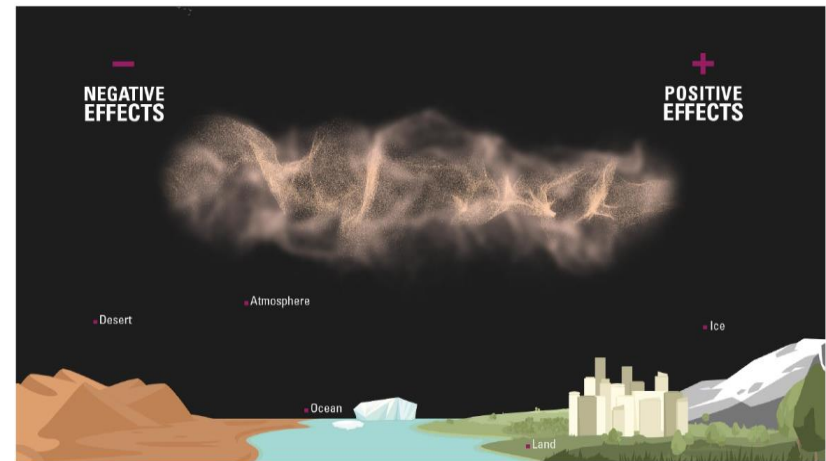
Training School on Dust Products, Aveiro (PT)



User Workshop on products for Health (ES)



## DISSEMINATION MATERIALS



in which **key stakeholders from different sector (health, transportation, energy, ...)** as **well as EC and National agencies** are taking part

# USER ENGAGEMENT: How?

and promote **collaborations** for **deeping** in the topic and **build capacity**



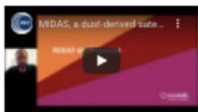
## DUST MINERALOGY AND CLIMATE BY C. PÉREZ



InDust webinar by Carles Pérez García-Pando (BSC, Spain). The lecture focused on the importance of dust mineralogy in climate. Dr. Pérez García-Pando is leading the ERC Consolidator Grant FRAGMENT: Frontiers in Dust Mineralogical Composition and its Effects upon Climate, whose goal is to understand and constrain the global mineralogical composition of dust along with its effects upon climate.

Download the webinar slides [here](#)

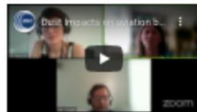
## A DUST-DERIVED SATELLITE DATASET BY A. GIKAS



InDust webinar by Antonis Gikas (National Observatory of Athens, Greece). The lecture focused on the presentation of NDAS, which is a global fine-resolution dust optical depth dataset and its applications for DA.

Download the webinar slides [here](#)

## DUST IMPACTS ON AVIATION BY B. SCHERLLIN-PIRSCHER



InDust webinar by Barbara Scherllin-Pirscher (ZAMG, Austria). The lecture focused on an overview of the different dust impacts on the aviation sector and the lessons learnt within the EUHADICS-Air project.

Download the webinar slides [here](#)

## AEROSOL TYPING FROM OBSERVATIONS BY L. MONA



InDust webinar by Lucia Mona (CNR-IMAA, Italy). The lecture consisted in giving an overview of the different aerosol remote sensing databases from ground-based and satellite observations and the challenges associated to perform an accurate aerosol type classification. This topic is part of the Aerosol Typing from Observations project.

## MINERAL DUST AND HEALTH EFFECTS BY X. QUEROL



InDust webinar by Xavier Querol (IDAEA-CSIC, Spain). The lecture focused on the characterisation of dust emissions in Europe and the applications of this information on health.

Download the webinar slides [here](#)

## HIGH-RESOLUTION GLOBAL DUST MAP BY A. VUKOVIC



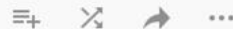
InDust webinar by Ana Vukovic (University of Belgrade, Serbia). The lecture focused on the efforts made to develop a high-resolution global dust map. The work is part of the Sand and Dust Storm Toolkit coordinated by UNCCO.

Download the webinar slides [here](#)








## inDust COST Action

17 videos • 204 views • Updated today



inDust is a COST-funded international network which provides research and assists sectors of society that are affected by airborne mineral dust. The Barcelona Supercomputing Center (BSC) is the Grant Holder of inDust COST Action (CA16202).

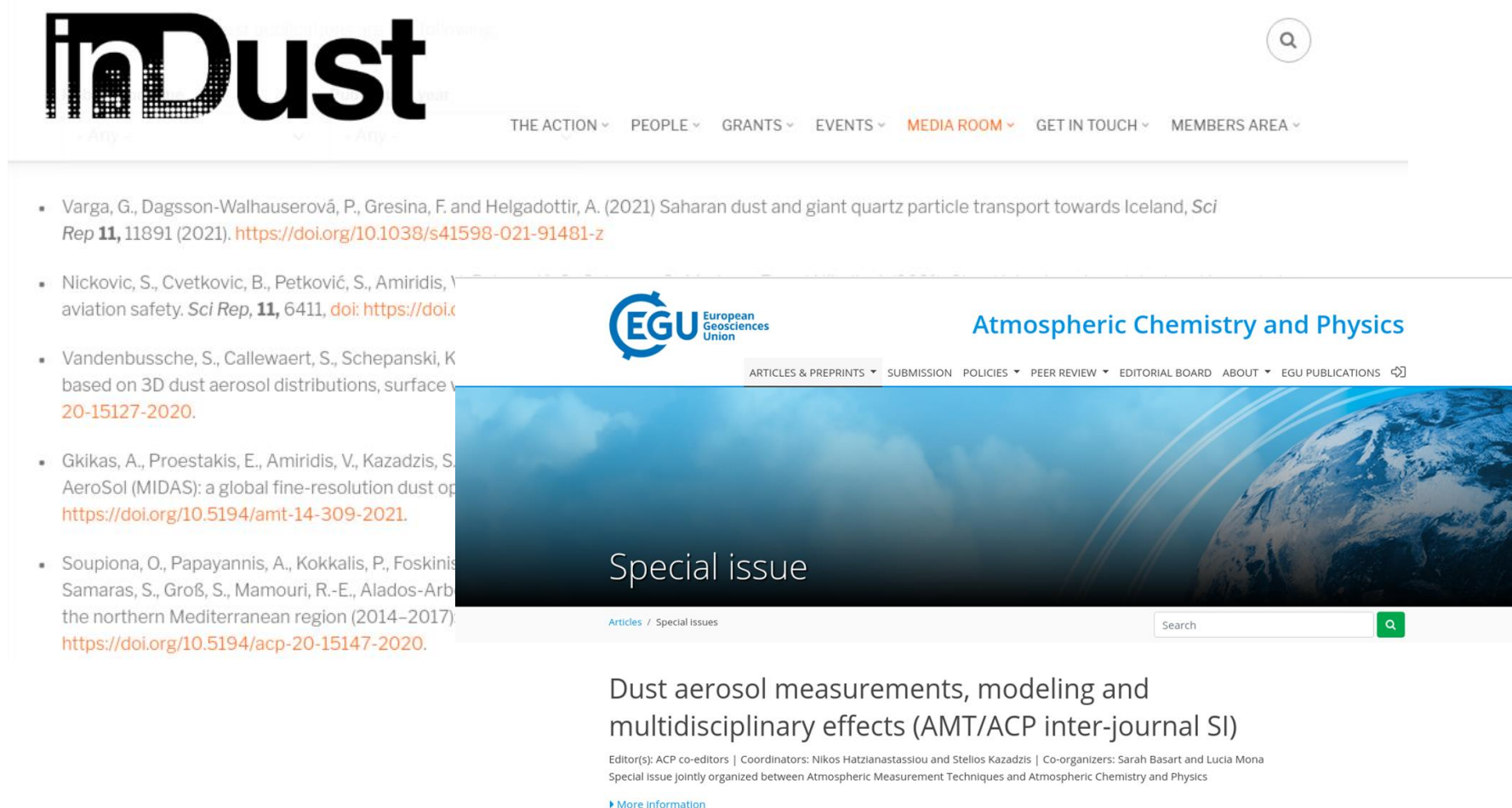
-  **inDust Research Visits 2018-2021**  
BSC CNS
-  **Slobodan Nickovic | inDust Research Visits 2018-2021**  
BSC CNS
-  **Michael Russo | inDust Research Visits 2018-2021**  
BSC CNS
-  **Clarissa Baldo | inDust Research Visits 2018-2021**  
BSC CNS
-  **Michael Pikridas | inDust Research Visits 2018-2021**  
BSC CNS



# USER ENGAGEMENT: How?

and promote **collaborations** for **deeping** in the topic and **build capacity**

More than **15 publications** and  
launch of an **Special Issue in ATM/ACP**



**inDust**

THE ACTION ▾ PEOPLE ▾ GRANTS ▾ EVENTS ▾ **MEDIA ROOM ▾** GET IN TOUCH ▾ MEMBERS AREA ▾

- Varga, G., Dagsson-Walhauserová, P., Gresina, F. and Helgadóttir, A. (2021) Saharan dust and giant quartz particle transport towards Iceland, *Sci Rep* **11**, 11891 (2021). <https://doi.org/10.1038/s41598-021-91481-z>
- Nickovic, S., Cvetkovic, B., Petković, S., Amiridis, V. et al. (2021) Saharan dust and aviation safety. *Sci Rep*, **11**, 6411, doi: <https://doi.org/10.1038/s41598-021-91481-z>
- Vandenbussche, S., Callewaert, S., Schepanski, K. et al. (2020) Dust aerosol measurements, modeling and multidisciplinary effects (AMT/ACP inter-journal SI) based on 3D dust aerosol distributions, surface fluxes and radiative forcing. *Atmospheric Chemistry and Physics*, **20**, 15127–2020. <https://doi.org/10.5194/acp-20-15127-2020>
- Gkikas, A., Proestakis, E., Amiridis, V., Kazadzis, S. et al. (2021) The AeroSol (MIDAS): a global fine-resolution dust optical properties dataset. *Atmospheric Chemistry and Physics*, **21**, 1009–1024. <https://doi.org/10.5194/amt-14-309-2021>
- Soupiona, O., Papayannis, A., Kokkalis, P., Foskinis, S., Samaras, S., Groß, S., Mamouri, R.-E., Alados-Arboleda, J. et al. (2020) Dust aerosol measurements, modeling and multidisciplinary effects (AMT/ACP inter-journal SI) in the northern Mediterranean region (2014–2017). *Atmospheric Chemistry and Physics*, **20**, 15147–2020. <https://doi.org/10.5194/acp-20-15147-2020>

**EGU** European Geosciences Union

**Atmospheric Chemistry and Physics**

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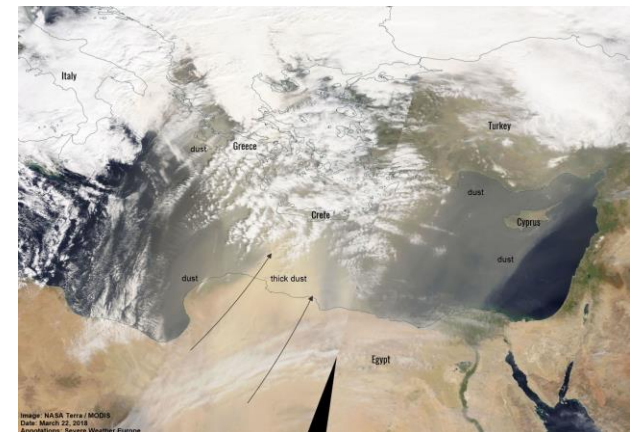
Dust aerosol measurements, modeling and multidisciplinary effects (AMT/ACP inter-journal SI)

Editor(s): ACP co-editors | Coordinators: Nikos Hatzianastassiou and Stellos Kazadzis | Co-organizers: Sarah Basart and Lucia Mona  
Special Issue jointly organized between Atmospheric Measurement Techniques and Atmospheric Chemistry and Physics

[More information](#)

# IMPACTS OF A STRONG DUST EPISODE OVER SOUTHEASTERN EUROPE

On 22nd March 2018, a large part of the Mediterranean Eastern countries experienced a very intense episode of African dust, **one of the most important of recent years. (Monteiro et al., STOTEN, 2022)**

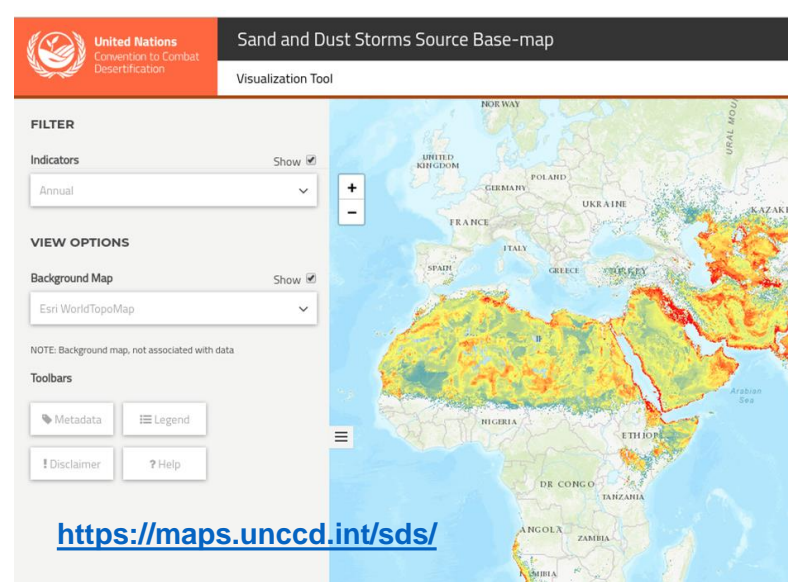
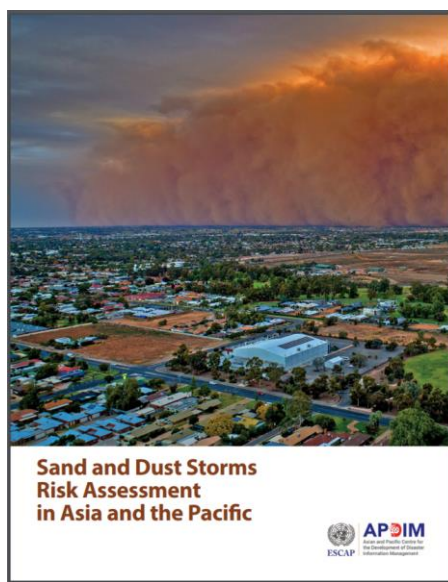
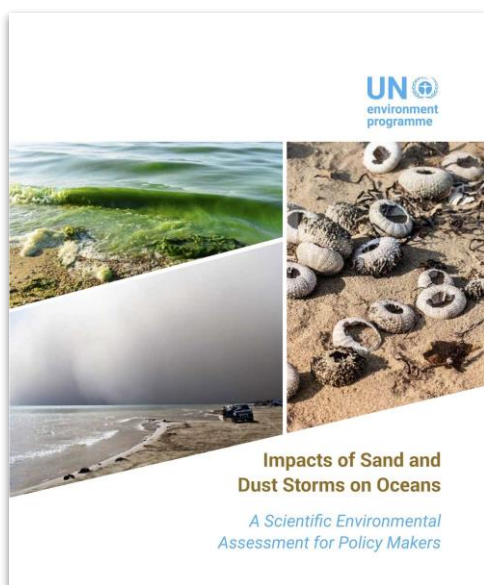


- Increase (3 times) of emergencies responses and hospital admissions.
- Reduction of visibility caused aircraft traffic disruptions in Crete.
- Reduction of solar energy production is estimated on ~10 MW.
- Lower bounded cost in Crete about **3.4-3.8 million EUR**

# Policy Impact

inDust members are part of scientific expert committees of several **UN and EC agencies and initiatives**

- FAIRMODE (European Commission)
  - Running National projects in Bulgaria, Iceland and Turkey
- ADPIM/ESCAP
- UNEP
- UNCCD
- WHO (AQ Guidelines 2021 incorporates a sections on mineral dust)
- WMO (through the SDS-WAS)
- UN Coalition for Combating Sand and Dust Storms





## inDust finishes on 30<sup>th</sup> October 2021

But this is not the end, we will continue promoting **tailored dust information** through

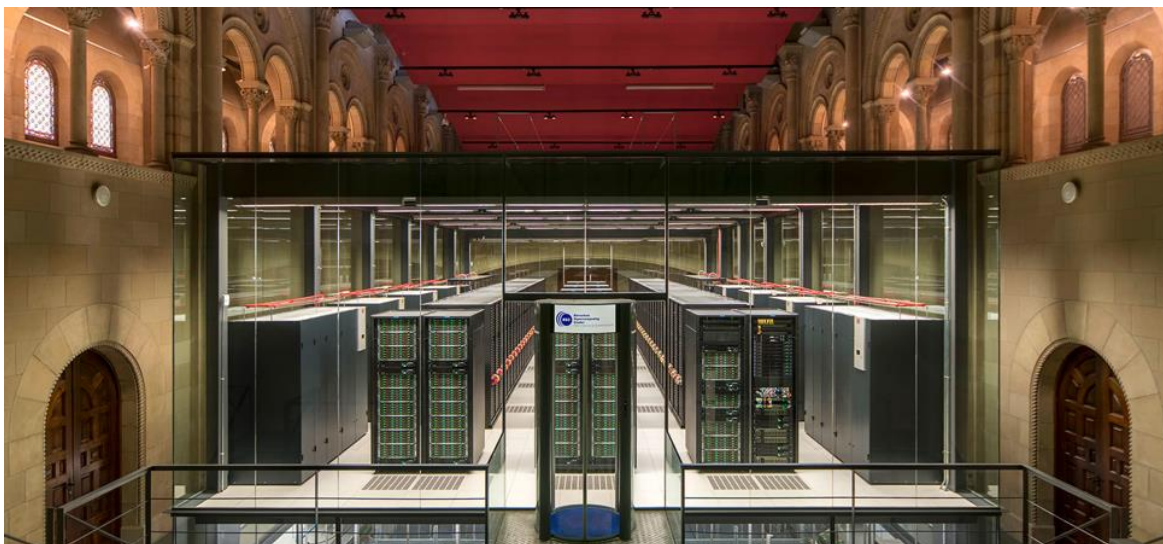


@Dust\_Barcelona

<https://dust.aemet.es/>

This WMO Regional Center is coordinating the efforts of the **SDS-WAS Regional Node** for **Northern Africa, Middle East and Europe** that considers a large contribution of researchers, data providers and (*thanks to inDust*) **user communities**

# WMO Barcelona Dust Regional Center is coordinating the WMO SDS-WAS activities Northern Africa, the Middle East and Europe



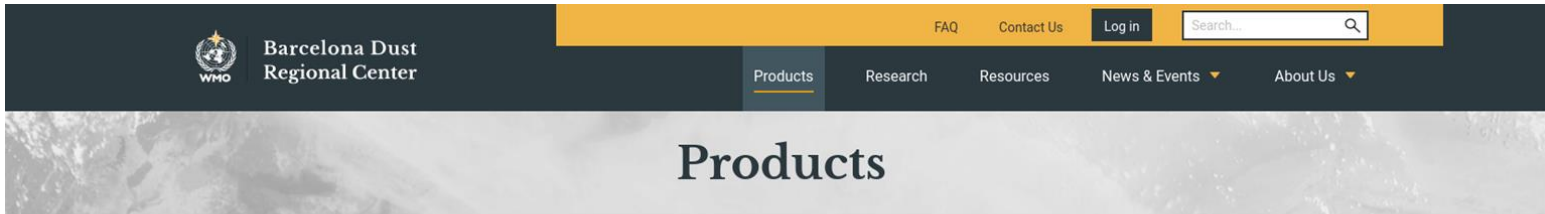
The WMO Barcelona Dust Regional Center  
is managed by AEMET and BSC

<https://dust.aemet.es/>  
[@Dust\\_Barcelona](#)

More than 10,000  
visits per month in  
our website

and more than 4,000  
Twitter followers in  
(at present 4,059  
followers in total)

# Dust Products



## Overview

The WMO Barcelona Dust Regional Center provides access to high-quality dust information for the benefit of society. This information is useful to predict the occurrence of Sand and Dust Storms (SDS), as well as to manage their effects and impacts. In this context, the Center offers a wide range of dust products, both models and observations, that serve the need for detailed dust information on a regional scale. A detailed description of all the products offered on the Center's website can be found in the User Guide.

[USER GUIDE](#)



## Daily Dust Products

Dust forecasts and dust-related observational products

[EXPLORE PRODUCT](#)

A screenshot of the "Dust Products Catalogue" web application. It displays a table with columns for Product Name, Description, and other details. The table lists various dust products available for download or viewing.

## Dust Products Catalogue

Inventory of available dust observational and modelling products

[EXPLORE PRODUCT](#)



## Data Download

Access and download the numerical data of dust forecasts

[EXPLORE PRODUCT](#)

<https://dust.aemet.es/>

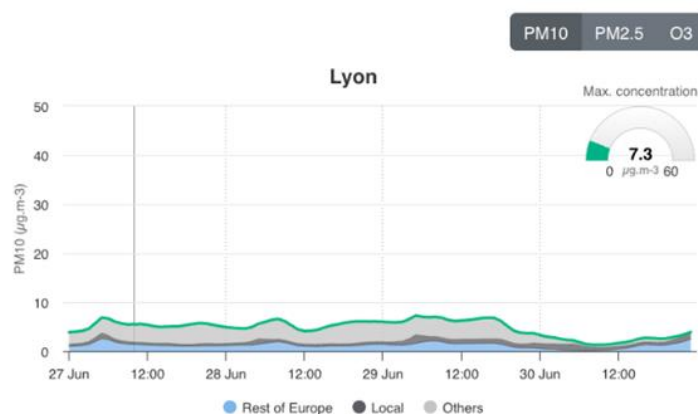
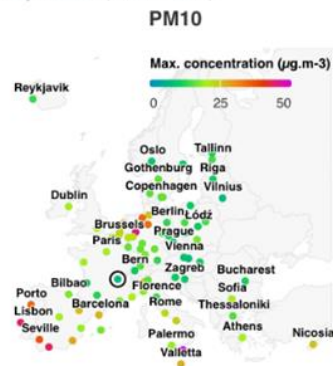


# CAMS Policy Support

<https://policy.atmosphere.copernicus.eu/>

## Air pollution at target cities

4-day forecast (EMEP model)



For more information and additional results (past results, comparisons with observations and source tagging with the LOTOS-EUROS model), check out the [daily air pollution forecasts](#) pages: [local/external](#) potential impact, [country](#) potential impact/contributions, and the PM<sub>10</sub> [chemical speciation](#).

## Our services

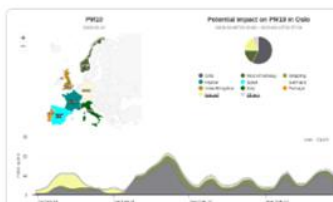
CAMS policy support provides a number of products and results that aim at supporting decision and policy making in the management of **air pollution episodes** and reporting under European Directives. Policy services are based on the air quality regional services capacities to elaborate added value products describing the evolution of air quality in Europe and the influence of the main anthropogenic sources, helping in designing appropriate and efficient policy responses to episode situations.



### Air Control Toolbox

The CAMS Air Control Toolbox offers a flexible framework to explore the benefit of **emission reduction** strategies.

[Data Access](#)



### Air Pollution Forecasts

Daily forecasts of **local/long-range** potential impact, allocation from **countries** of PM<sub>10</sub>, PM<sub>2.5</sub> and O<sub>3</sub> in European cities, and **chemical speciation** of PM<sub>10</sub>.

[Data Access](#)



### Air Quality Reports

Find reports on major **air pollution episodes** in Europe (fine particles, ozone, forest fires, ...), as well as **annual assessment** reports.

[Reports Access](#)

## Home

### Control Scenarios

[Air Control Toolbox](#)

[Policy scenarios](#)

### Daily Air Pollution Forecasts

[Local/Long-range](#)

[From countries](#)

[Chemical speciation](#)

### Yearly Air Pollution Analysis

[Source regions](#)

[Chemical speciation](#)

[Comparison with observations](#)

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[Episodes analysis](#)

[Annual source-receptor reports](#)

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[Annual assessments reports \(validated\)](#)

[Projections for 2050](#)

### Workshops

### FAQ

# Summarising

- Sand and Dust Storms (SDS) play a significant role in different aspects of weather, climate and atmospheric chemistry and represent a **serious hazard** for life, health, property, environment and economy.
- Understanding, managing and mitigating **SDS risks** and effects requires fundamental and cross-disciplinary knowledge.
- **inDust** focused to build a community of researches and users that can start to design the strategy to develop **dust services**.



*Tehran, Iran, June 2014*

# Thanks a for you attention

My special thanks to **inDust networks and the more of 300** participants.

The work presented here it is possible thanks to the support of collaboration of the active members of the **WMO SDS-WAS** and particularly to the NAMEE Regional Node partners.

Also, thanks to the associated researchers from NASA (i.e. AERONET, MODIS), EUMETSAT as well as the DustClim consortium and DANA and IceDust networks.

<https://dust.aemet.es/>  
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