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Barcelona Supercomputing Center
Centro Nacional de Supercomputación

Dust Forecast Services

WMO SDS-WAS and Barcelona Dust Forecast Center

Francesco Benincasa

Amman, 2nd of November 2015

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Barcelona
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OUTLINE

OUTLINE

- WMO SDS-WAS NA-ME-E Regional Center
  - Web portal
  - Howto use it
  - Products and Services
- Barcelona Dust Forecast Center
  - Web portal
  - Products and Services

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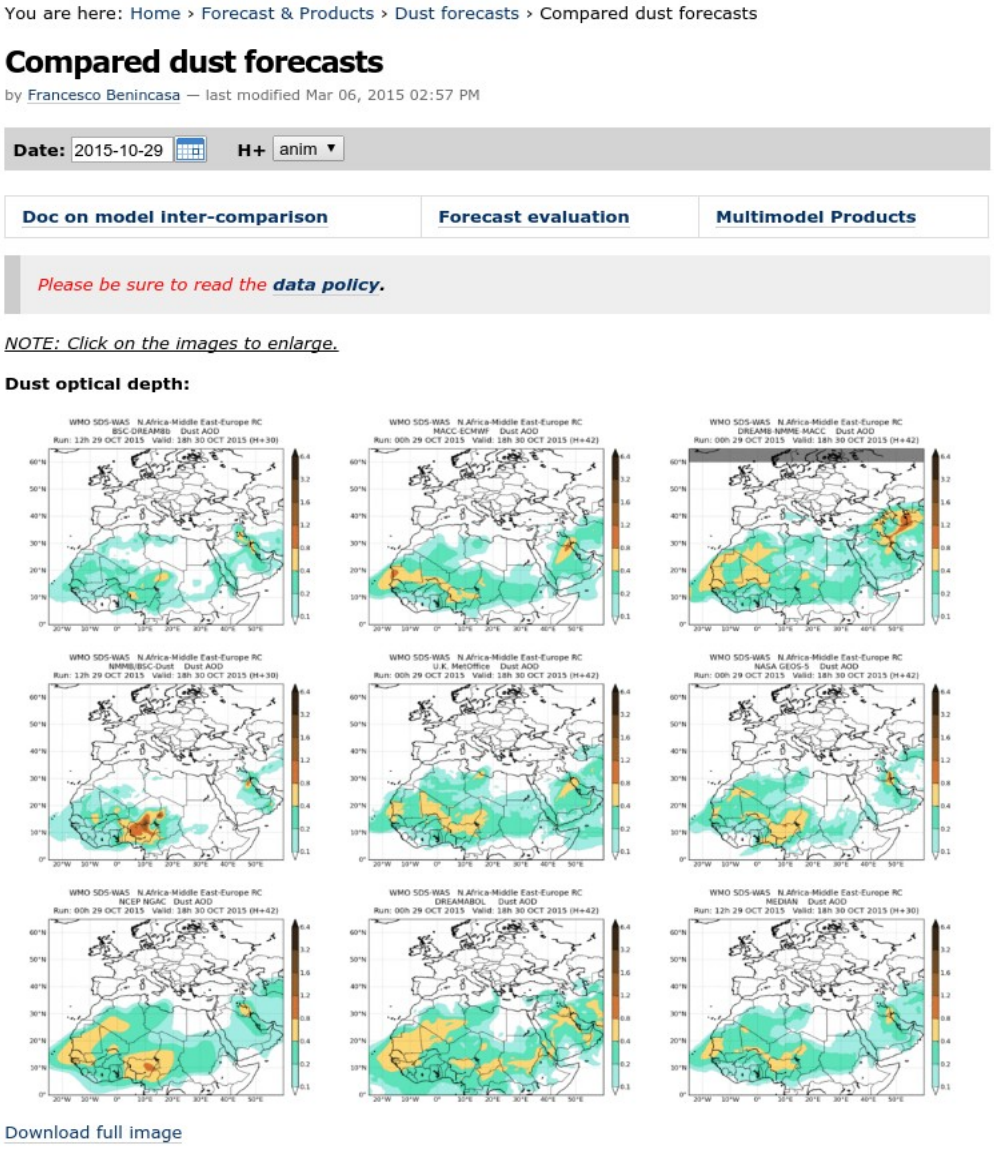
WMO SDS-WAS NA-ME-E Regional Center

WMO SDS-WAS NA-ME-E Regional Center

- Research and development
  - Retrieving
    - Data models
    - Data observacions
  - Producing
    - Dust forecasts of 2 variables (Surface concentration and Aerosol optical depth) of 9 (10) numerical models + 4 multi-model products
    - Models evaluation against observations
    - Studies of dust episodes
    - Workshop, training courses and seminars

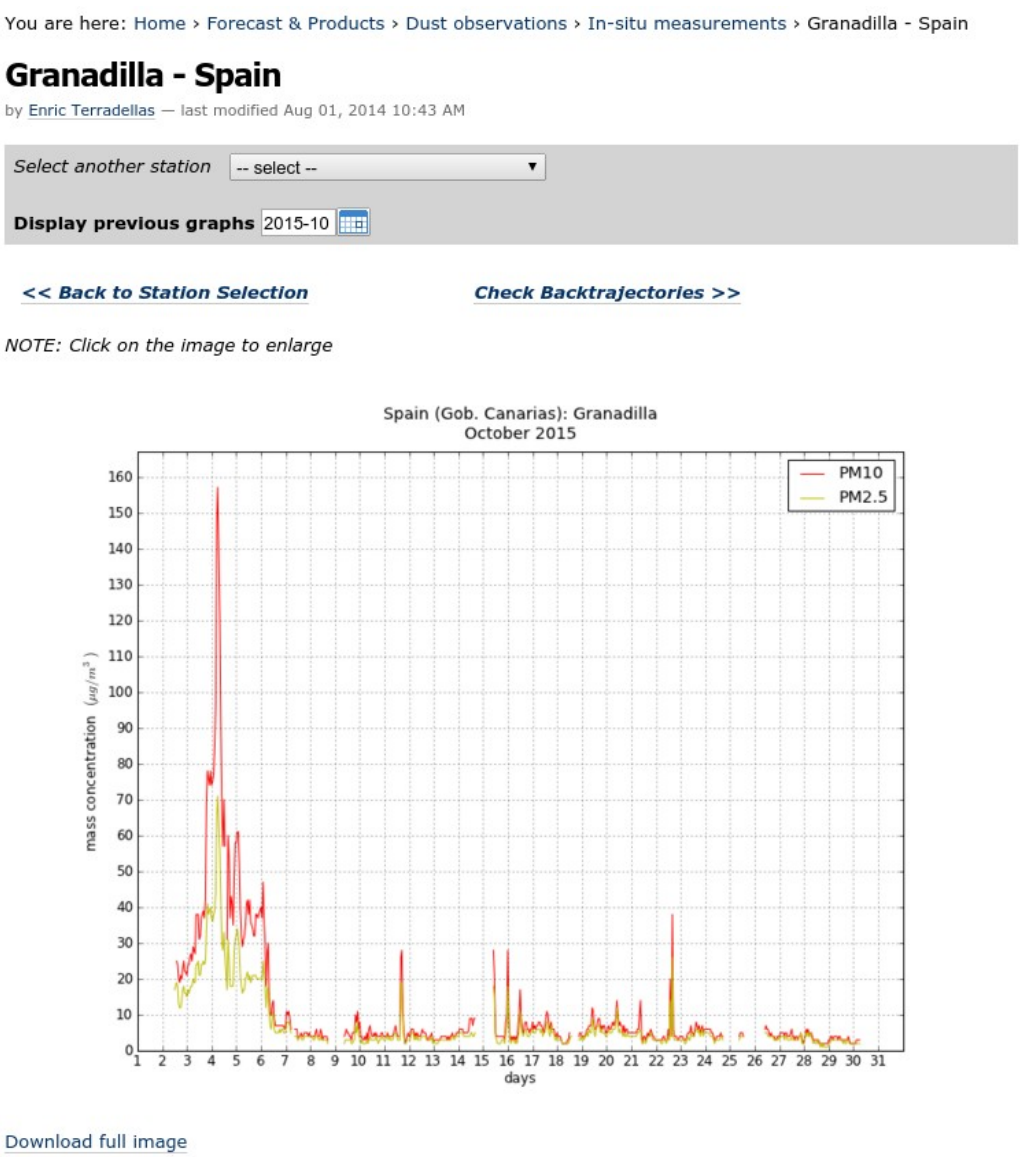
WMO SDS-WAS NA-ME-E Regional Center

- http://sds-was.aemet.es
  - ***Browsable*** images
    - Forecast



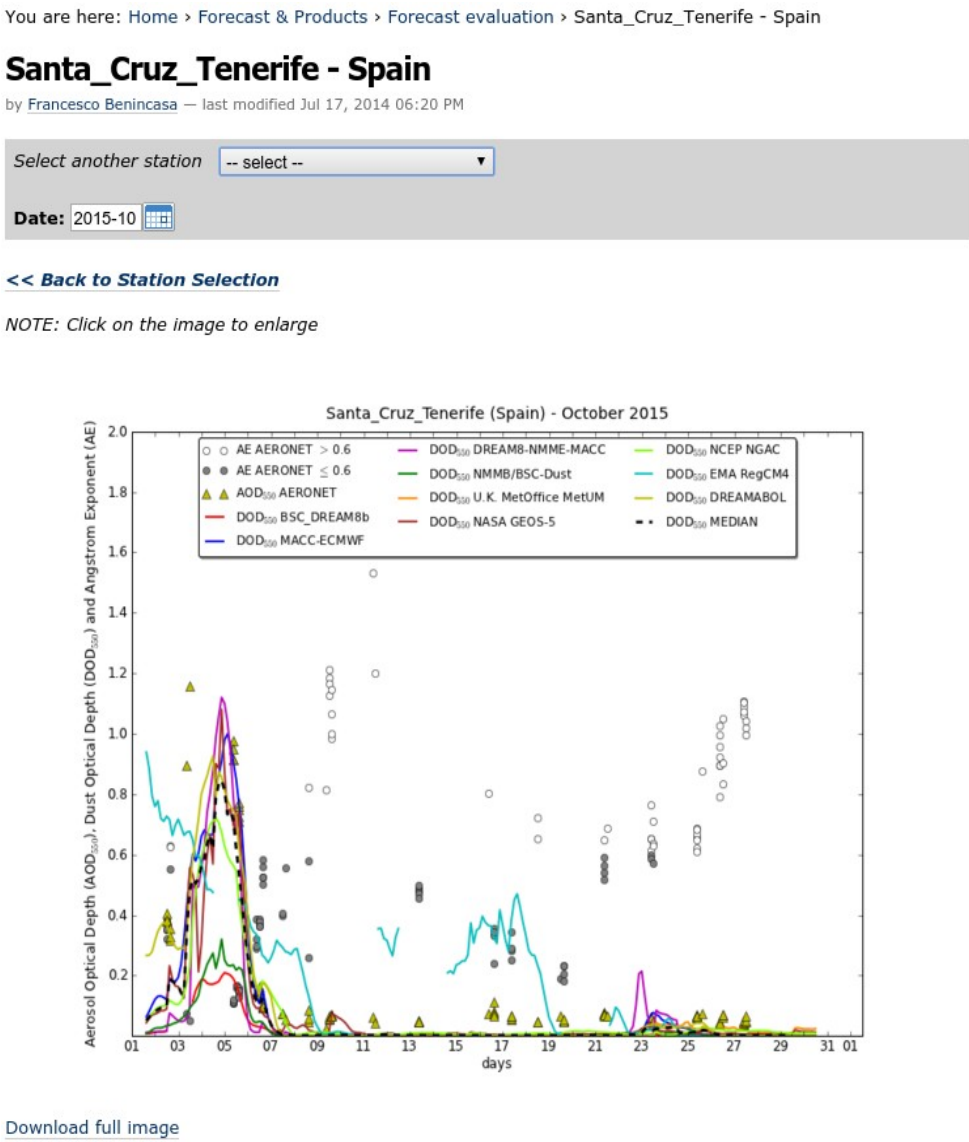
WMO SDS-WAS NA-ME-E Regional Center

- http://sds-was.aemet.es
  - ***Browsable*** images
    - Forecast
    - Observacions



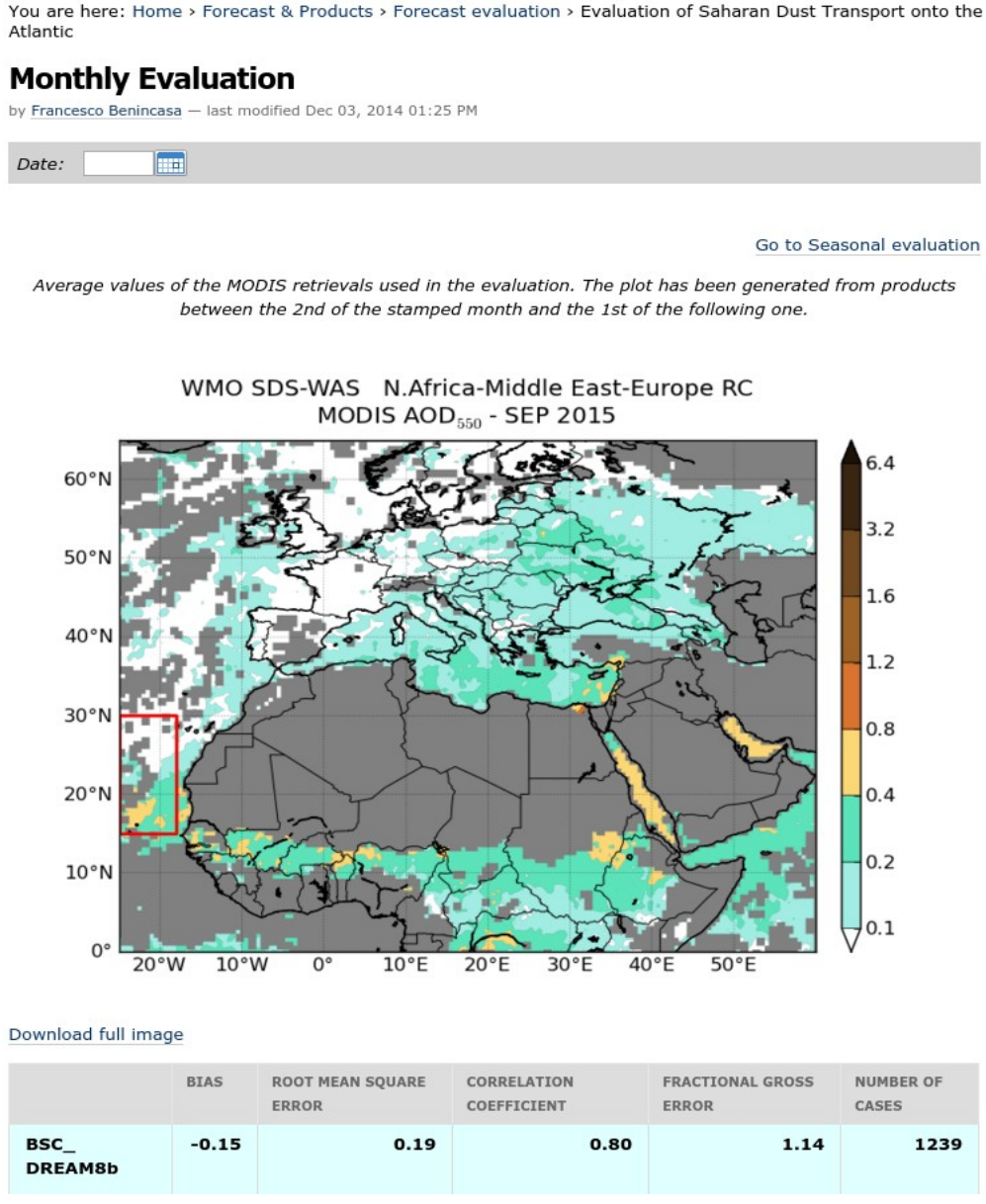
WMO SDS-WAS NA-ME-E Regional Center

- http://sds-was.aemet.es
  - ***Browsable*** images
    - Forecast
    - Observacions
    - Evaluation
      - AERONET



WMO SDS-WAS NA-ME-E Regional Center

- http://sds-was.aemet.es
  - ***Browsable*** images
    - Forecast
    - Observacions
    - Evaluation
      - AERONET
      - MODIS



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WMO SDS-WAS NA-ME-E Regional Center

- http://sds-was.aemet.es
  - Numerical evaluation scores archive

Monthly scores

by Francesco Benincasa — last modified Nov 27, 2014 11:51 AM

Date:

Sep 2015. Dust Optical Depth.
Threshold Angstrom Exponent = 0.600

BIAS

	BSC_ DREAM8b	MACC-ECMWF	DREAM8-NMME-MACC	NMMB/BSC-Dust	U.K. Met Office	NASA GEOS-5	NCEP NGAC	EMA RegCM4	DREAM ABOL	MEDIAN
Sahel/Sahara show stations	**-0.28**	**-0.16**	**-0.12**	**-0.32**	**N/A**	**-0.20**	**-0.09**	**-0.05**	**0.02**	**-0.17**
Middle East show stations	**-0.28**	**-0.24**	**-0.22**	**-0.46**	**N/A**	**-0.27**	**-0.36**	**-0.23**	**0.02**	**-0.27**
Mediterranean show stations	**-0.31**	**-0.24**	**-0.23**	**-0.36**	**N/A**	**-0.25**	**-0.22**	**-0.20**	**-0.16**	**-0.26**
TOTAL	**-0.30**	**-0.20**	**-0.18**	**-0.35**	**N/A**	**-0.23**	**-0.17**	**-0.13**	**-0.06**	**-0.22**

ROOT MEAN SQUARE ERROR

	BSC_ DREAM8b	MACC-ECMWF	DREAM8-NMME-MACC	NMMB/BSC-Dust	U.K. Met Office	NASA GEOS-5	NCEP NGAC	EMA RegCM4	DREAM ABOL	MEDIAN
Sahel/Sahara hide stations	**0.48**	**0.42**	**0.41**	**0.50**	**N/A**	**0.43**	**0.40**	**0.49**	**0.42**	**0.42**
Capo_Verde	0.27	0.12	0.17	0.31	N/A	0.19	0.16	0.30	0.17	0.16
Dakar	0.60	0.48	0.44	0.65	N/A	0.51	0.43	0.51	0.43	0.48
IER_Cinzana	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Banizoumbou	0.67	0.60	0.56	0.68	N/A	0.60	0.56	0.59	0.54	0.58
Zinder_Airport	0.23	0.19	0.14	0.26	N/A	0.21	0.15	0.34	0.28	0.17
Santa_Cruz_ Tenerife	0.10	0.12	0.13	0.14	N/A	0.10	0.10	0.25	0.17	0.11
Zouerate-Fennec	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tamanrasset_ INM	0.35	0.20	0.24	0.37	N/A	0.25	0.23	0.34	0.37	0.22

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- http://sds-was.aemet.es
  - Numerical evaluation scores archive
  - Numerical data archive

Files Download

by Francesco Benincasa — last modified Jan 16, 2015 01:31 PM — History

This page allows downloading numerical dust forecasts issued by different dust prediction models. Dust models may have very different characteristics (global or regional, horizontal and vertical resolutions, dust emission and deposition parameterizations, presence or absence of data assimilation, feedback to the meteorological model, ...). Information on the characteristics and configurations of the models can be found on their respective websites.

> *Please be sure to read the **data policy**.*

Models currently available are:

BSC-DREAM8b v2.0	DOWNLOAD FILES	Model website	Barcelona Supercomputing Center
MACC-ECMWF	DOWNLOAD FILES	Model website	macc
DREAM-NMME-MACC	DOWNLOAD FILES	Model website	SEEVCCC
NMMB/BSC-Dust	DOWNLOAD FILES	Model website	Barcelona Supercomputing Center
NASA-GEOS-5	DOWNLOAD FILES	Model website	NASA
NCEP-NGAC	DOWNLOAD FILES	Model website	NCEP
DREAMABOL	DOWNLOAD FILES	Model website	ISAC
EMA-RegCM4	DOWNLOAD FILES	Model website	EGYPTIAN METEOROLOGICAL AUTHORITY
Multimodel MEDIAN	DOWNLOAD FILES	Model website	WMO / BSC / AEMet

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WMO SDS-WAS NA-ME-E Regional Center

- Main products
  - Dust forecast ensemble
  - Visibility
  - Eumetsat RGB products archive

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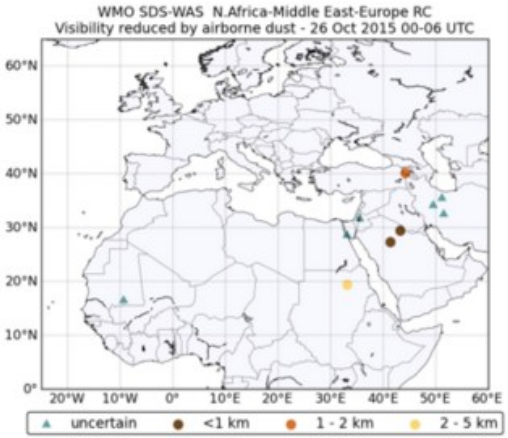
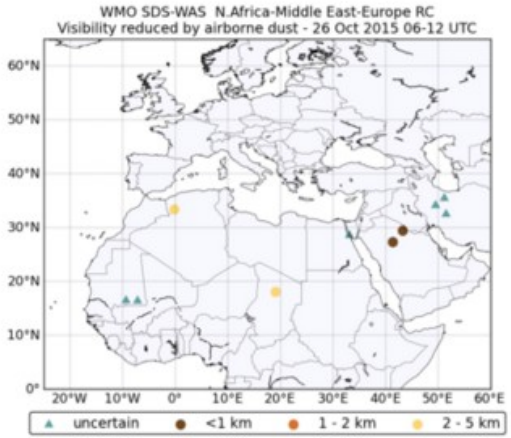
You are here: Home › Forecast & Products › Dust observations › Visibility

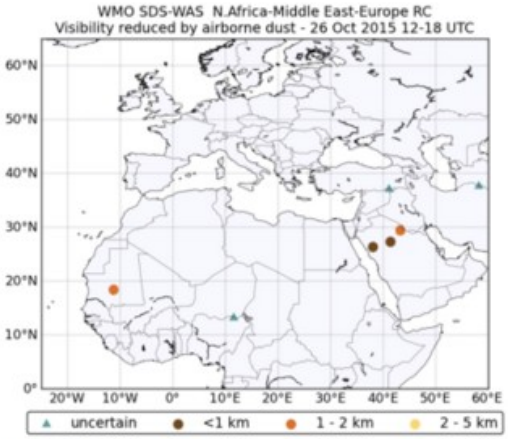
Visibility

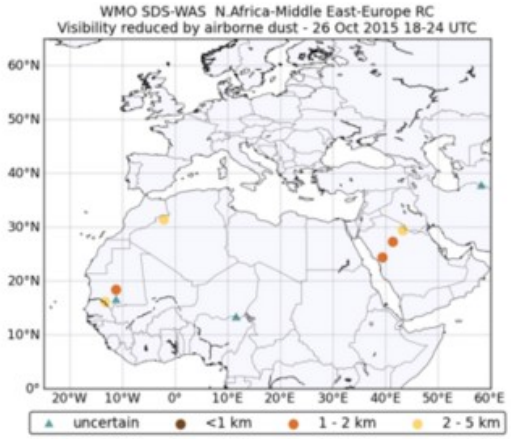
by Francesco Benincasa — last modified Oct 28, 2015 09:32 AM

Date 2015-10-26









Download full image

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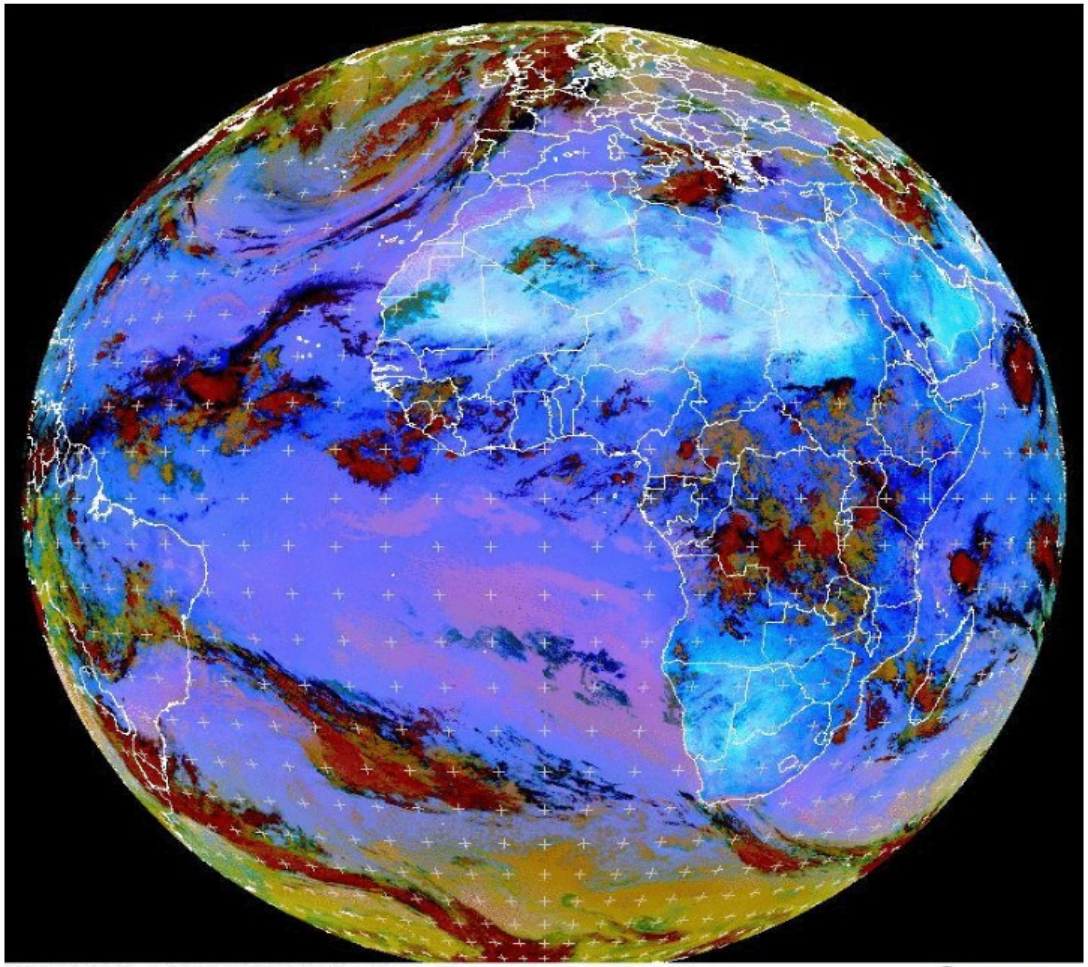
You are here: Home › Forecast & Products › Dust observations › MSG – EUMETSAT

MSG – EUMETSAT

by Francesco Benincasa — last modified May 29, 2012 03:26 PM

Date: 2015-10-30 anim



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- Main services
  - Dust News & Events
  - Newsletters
  - Materials

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Materials

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Meningitis

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Materials

- Training
- Workshops
- Dust Events
- Scientific Documentation
- Technical Reports
- Meningitis
- ACMAD bulletins

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Latest News

Equipment calibration and staff training at Izana Atmospheric Research Center
Oct 29, 2015

The edge of crisis: Dust and sand storms
Oct 29, 2015

You are here: Home › Materials › Meningitis

Meningitis

by Enric Terradellas — last modified May 21, 2014 02:34 PM

- Climate & Health Bulletin: Meningitis Vigilance Zones
- WHO Meningitis Weekly Bulletin
- Meningitis Vaccine Project
- Meningitis Environmental Risk Information Technologies (MERIT)

Meningococcal meningitis is a bacterial form of meningitis, a serious infection of the meninges that affects the brain membrane. It commonly causes epidemics with high fatality rates. The largest epidemics occur in the arid areas of sub-Saharan Africa: the so-called African meningitis belt, which stretches from Senegal to Ethiopia. They occur in seasonal cycles between end of November and end of June, depending on the location, and decline rapidly with the arrival of the rainy season. The yearly average incidence is about 40,000-50,000 cases with a 10% of deaths and a 10-20% of affected by permanent neurological sequelae.

It is believed that low absolute humidity and presence of dust may enhance meningococcal invasion, either by damaging the mucosal barrier and allowing bacterial penetration, or by inhibiting mucosal immune defences. A controversial hypothesis suggests that dust particles might serve as bacterial carriers, thus facilitating the transmission.

- Cuevas, E., C. Pérez, J.M. Baldasano, C. Camino, S. Alonso-Pérez and S. Basart (2011): Long-term retrospective analysis of dust and AI with meningitis epidemics data, MACC O-INT WP3. (Meningitis linked to mineral dust transport in the Sahel). 2nd. delivery report.

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Barcelona Dust Forecast Center

Barcelona Dust Forecast Center

- Operational center
  - Operated by BSC and AEMET
  - Officially recognized by the WMO
  - 72 hours forecast (3-hourly) model developed at BSC
  - 6 variables (Optical depth, Dry and Wet deposition, Load, Surface concentration, Surface extinction)

Barcelona Dust Forecast Center

- http://dust.aemet.es

- Products
  - Forecast images
  - Google Earth integration (KML/KMZ files)
  - Averaged values images
  - Zoomed area forecast images (Spain, Burkina Faso, ...)

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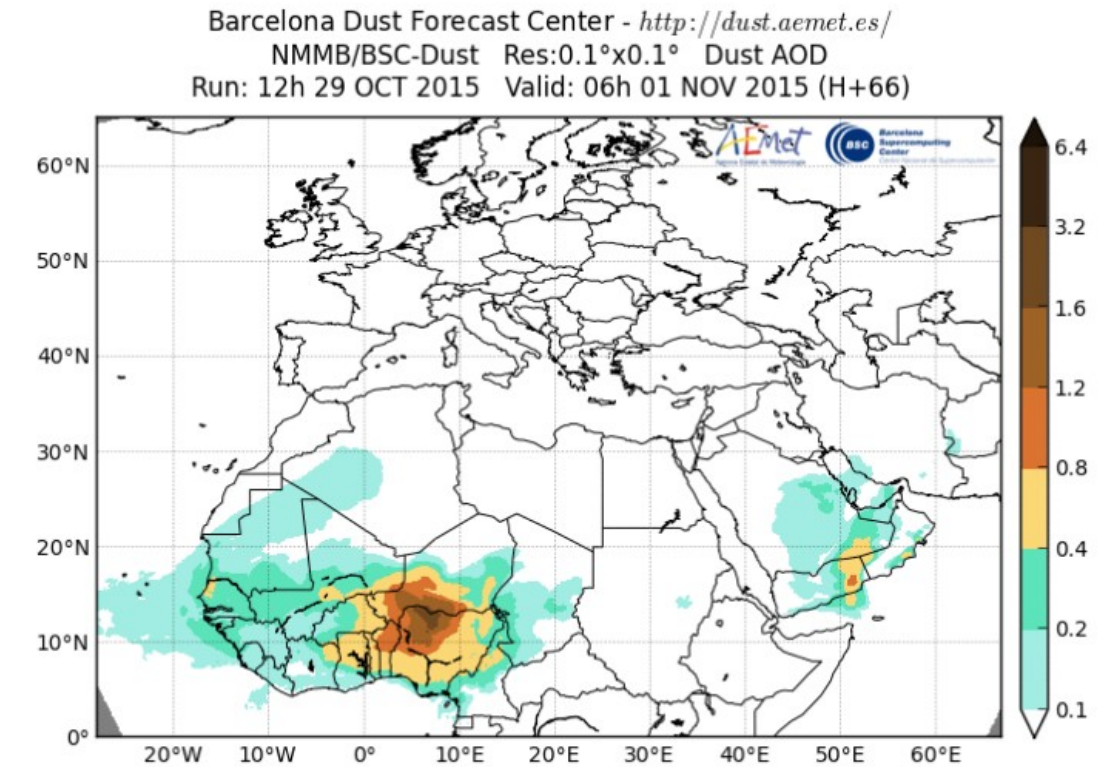
You are here: Home / Forecast

Dust Optical Depth

Date 2015-10-29 H+ anim Variable Dust Optical Depth

The NMMB/BSC-Dust model



▶ Download image ▶ KML - Online ▶ KMZ - Offline

What are KML/KMZ files?

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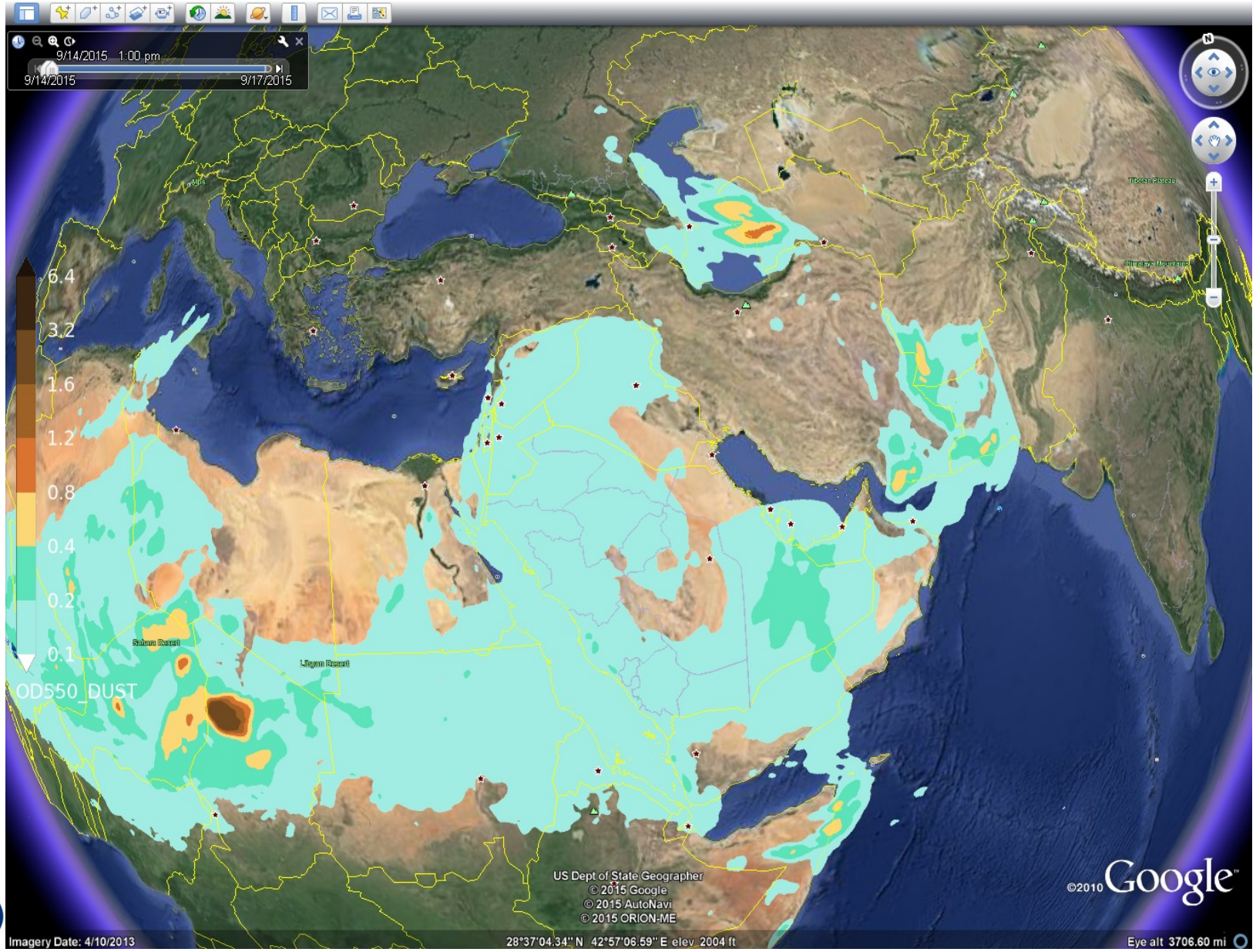

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You are here: Home / Other products / Averaged values

Monthly averaged values

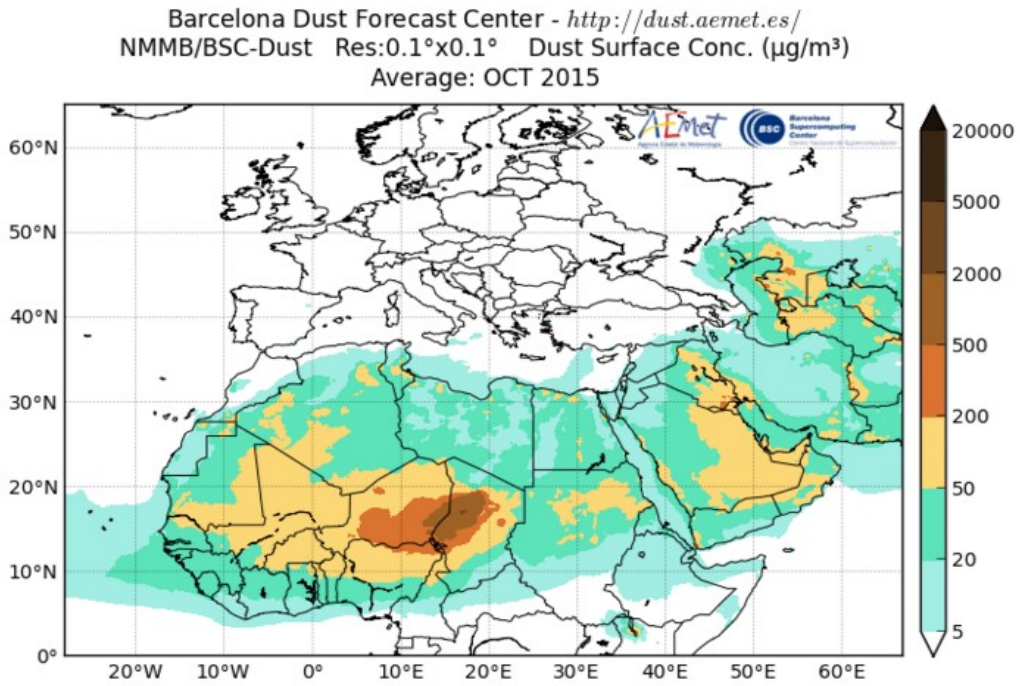
Monthly averaged values of dust surface concentration and dust load computed from the daily runs of the NMMB/BSC-Dust model.

Date 2015-10

Methods: Time-averaged values

NOTE: Click on the images to enlarge

Monthly Averaged Dust Surface Concentration (µm/m³)



▶ Download image

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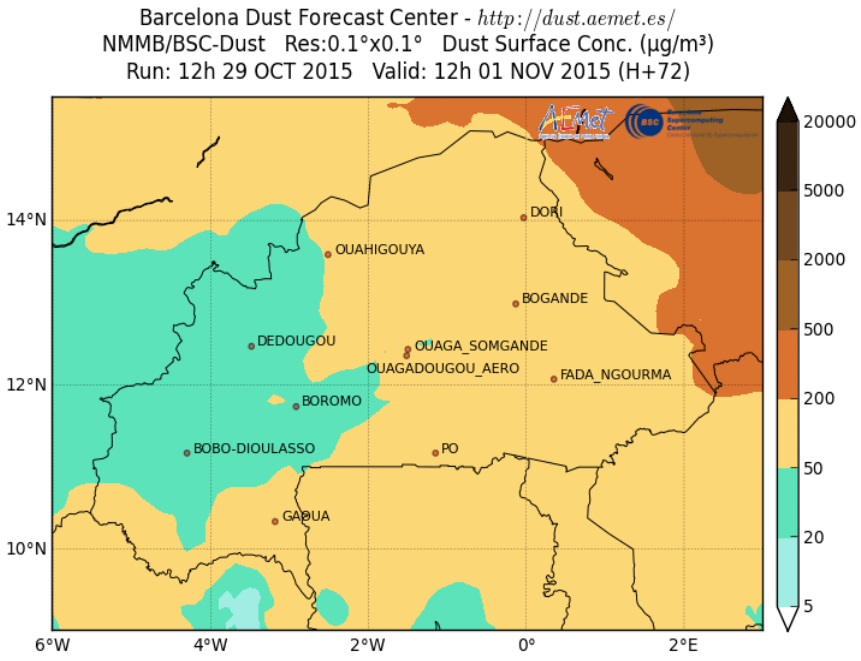
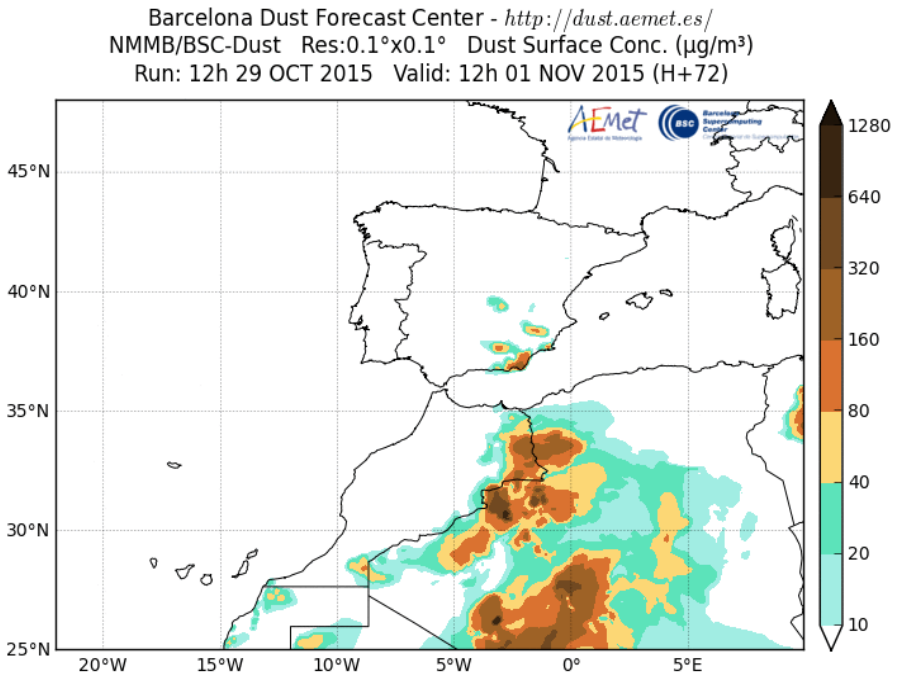


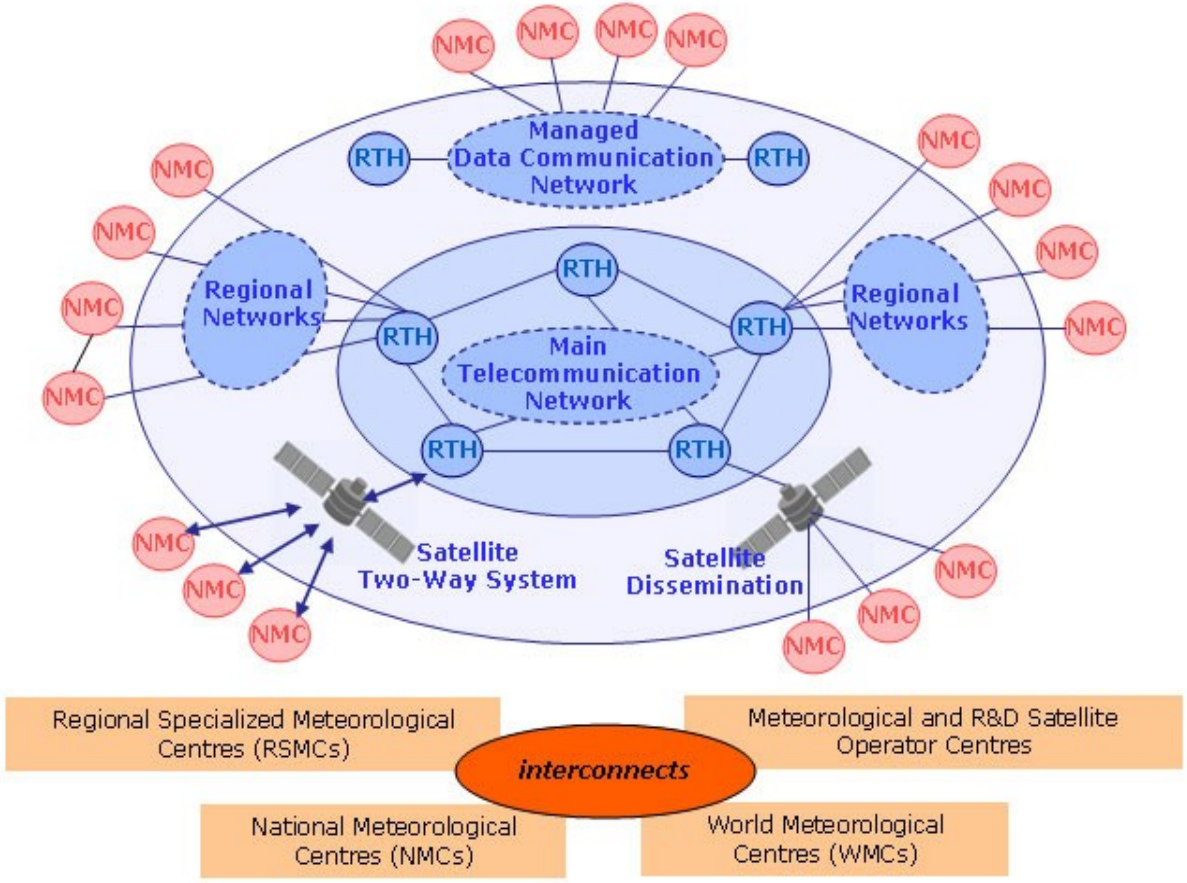


Barcelona Dust Forecast Center

- Services
  - Forecast images dissemination
    - WMO GTS (Global Telecommunication System)
    - EUMETCast (EUMETSAT's primary dissemination mechanism)
  - News & Events, Newsletter

Barcelona Dust Forecast Center

WMO GTS



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WMO GTS

- Global network for transmission of meteorological data
- Data proceeding from weather stations, satellites and NWP centres
- Implemented and operated by
  - National meteorological services
  - Other international organizations (ECMWF, EUMETSAT, ...)

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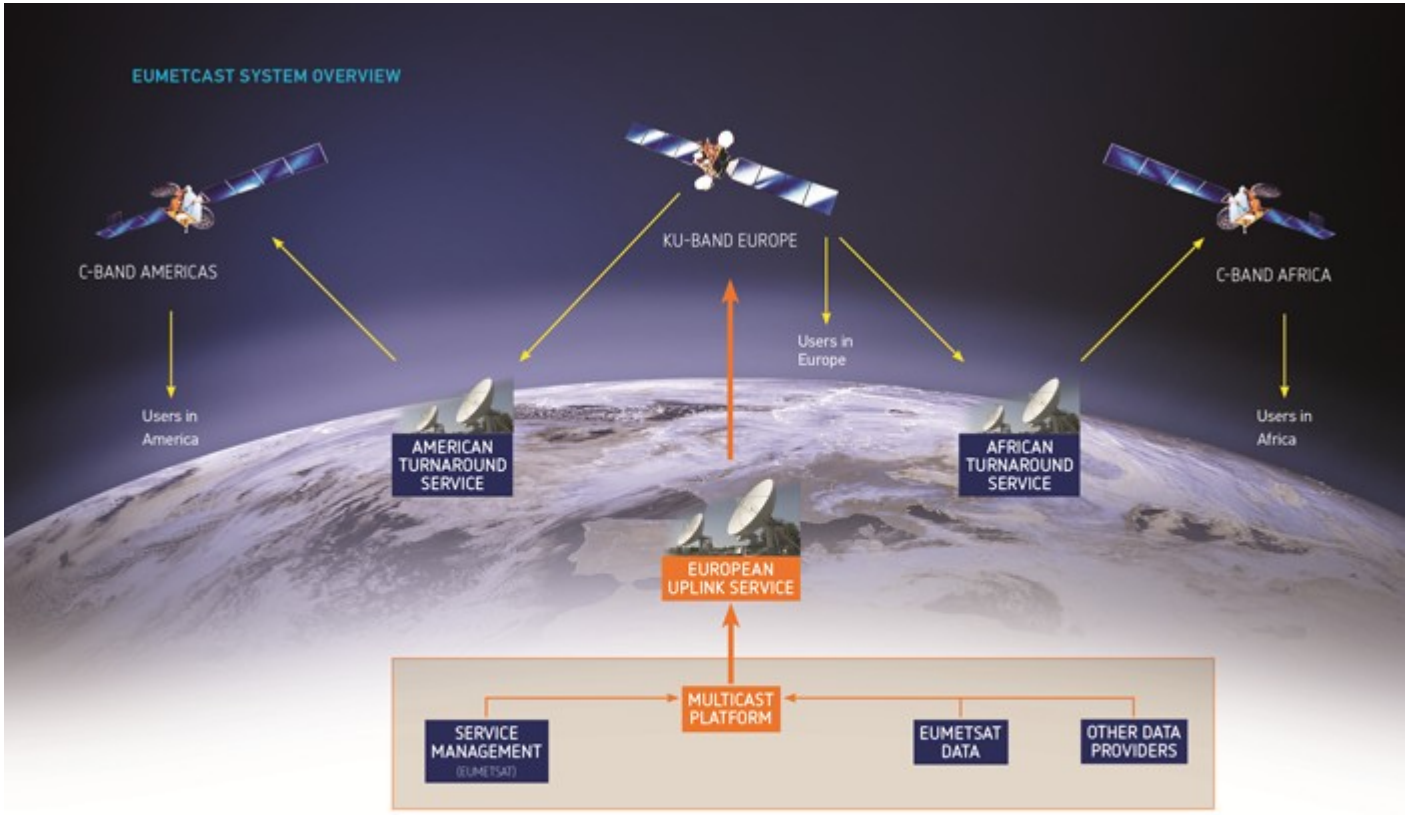
EUMETCast



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EUMETCast

- Multi-service dissemination system based on standard Digital Video Broadcast (DVB) technology
- It uses commercial telecommunication geostationary satellites
- Multi-cast files (data and products) to a wide user community
- From 15th of October 2015 **BDFC** products are distributed over Europe and Africa

www.bsc.es

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Thank you!

For further information please contact

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