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Centro Nacional de Supercomputación

Desert dust modelling and forecasting in the BSC: SDS-WAS NAMEE RC

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Earth Sciences Department
Barcelona Supercomputing Center

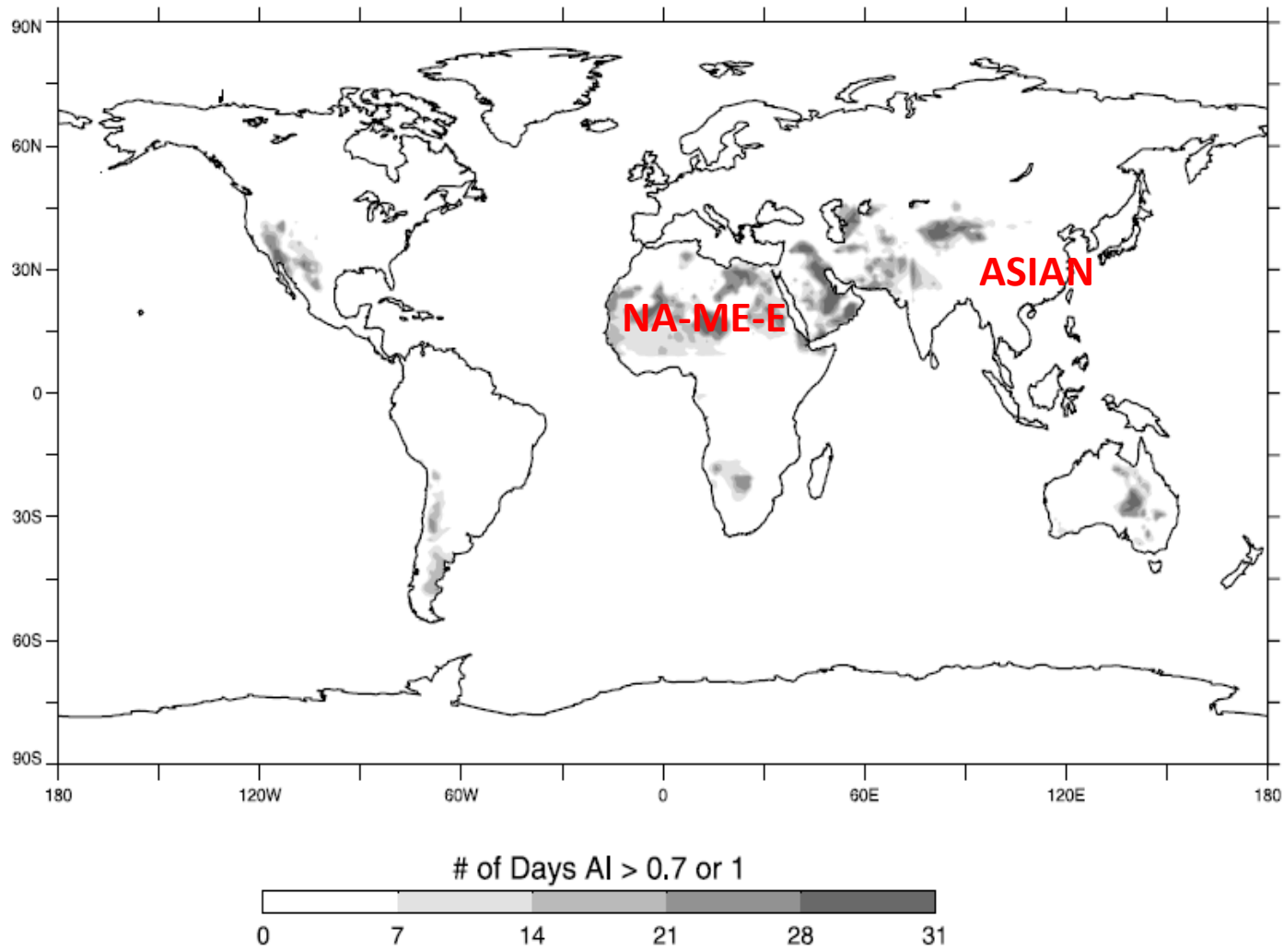


The screenshot shows the WMO website interface. At the top, there are navigation links for 'Print', 'Save as PDF', 'Text-only version', 'Send by e-mail', and 'Bookmark'. Below these are language options: 'عربي - 中文 - Français - Русский - Español - Other languages'. The main header features the WMO logo and the text 'World Meteorological Organization Weather • Climate • Water'. A secondary navigation bar includes 'HOME' and 'CONTACT US'. A left sidebar contains a menu with items like 'About us', 'Governance', 'Members', 'Media centre', 'Programmes', 'GFCS', 'Meetings', 'Publications', 'Library', 'Learning', 'Meteterm', 'Partnership', 'Themes', 'Vacancies', 'Visitors' info', and 'Youth corner'. Below the menu is a search box. The main content area has a title 'World Weather' and a breadcrumb 'WWRP > SDS >'. The main heading is 'WMO Sand and Dust and Asses (SD)'. Below this is the WWRP logo. A section titled 'The SDS-WAS programme at WMO' contains text: 'SDS-WAS was established in 2007 in respo to improve capabilities for more reliable san products from atmospheric dust models may areas of societal benefit. It will rely on real- More than 15 organizations currently pro regions. The SDS-WAS integrates research agricultural users). SDS-WAS is establishe regional nodes. At the moment two nodes Europe Node (hosted by Spain) and the Asi is to achieve comprehensive, coordinat capabilities of sand and dust storms in o storms to increase the understanding of th capabilities. Scientific background and modeling of sand SDS-WAS Science and I'.

OBJECTIVES:

- Identify and improve products to monitor and predict atmospheric dust by working with research and operational organizations, as well as with users
- Facilitate user access to information
- Strengthen the capacity of countries to use the observations, analysis and predictions provided by the WMO SDS-WAS programme

SDS-WAS Regional Centers



*The global distribution of TOMS dust sources.
Extracted from Prospero et al. (2002, Rev. Geophys.)*

SDS-WAS: Asian RC (<http://www.sds.cma.gov.cn>)

WMO Sand and Dust Storm Warning Advisory and Assessment System(WMO SDS WAS)
ASIA/CENTRAL PACIFIC REGIONAL CENTRE

Home | Forecast | Observation | Model InterComparison | News & Event | Publications | About us

FORECAST

Concentration
Movies of surface dust concentration distribution over Asia in 3 hours interval for 3 days forecast from the model CUACE/Dust.

CUACE/DUST OF CMA [see more>>](#) [MORE](#)

MASINGAR OF JMA [see more>>](#) [MORE](#)

ADAM OF KMA [see more>>](#) [MORE](#)

News & Event

- Severe Solar Blast Affects China's Communication
- Science Steering Committee
- Workshop on the Implementation of the WMO SDS-WAS Asia Node (28-30 October 2009, Seoul, Korea)
- Workshop on the Implementation of the WMO SDS-WAS Asia Node

OBSERVATION

PM10

CMA JMA KMA Other

AOD

CMA JMA KMA Other

Satellite Observation

CMA JMA KMA Other

MODEL COMPARISON

Model InterComparison
To promote the SDS forecast ability and to evaluate SDS forecast models representation in Asia Regional Center, one of the most important activities is model inter-comparison. At present there are three operational forecast models CUACE/Dus...

LOGIN

username
password
checking

[Login](#) [Register](#)

SDS COLOR INDEX

No SDS
Suspended dust
Blowing sand
Sand And Dust Storm
Severe SDS
Extreme Severe SDS

HDT LINKS

- cma
- wmo sds was
- ca was
- cms
- national regional center

FORECAST DATA SHARING

Download Forecast Data from

The Center is managed by a consortium of AEMET and the Barcelona Supercomputing Center (BSC-CNS)



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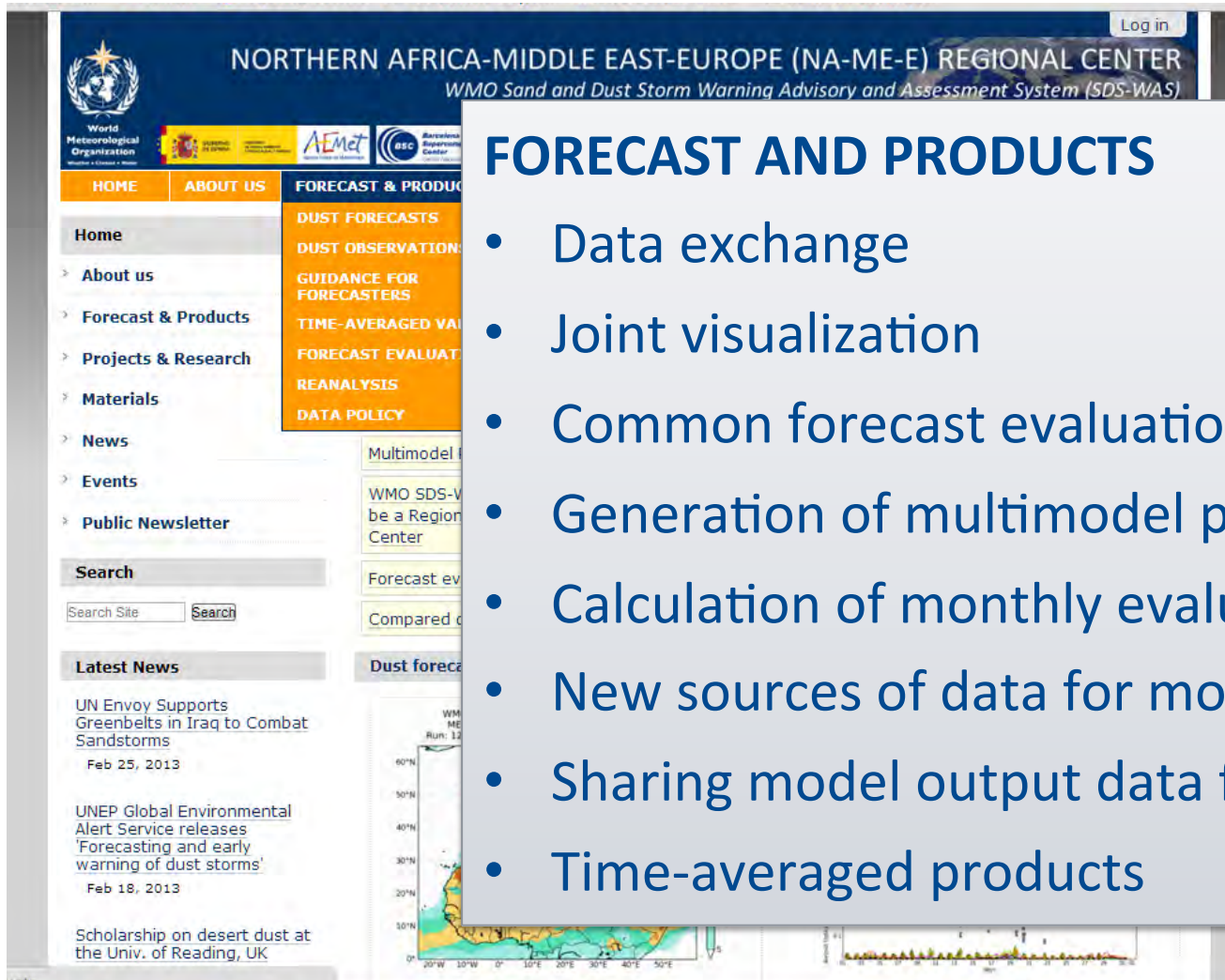
Nexus II Building. Barcelona



MareNostrum supercomputer



SDS-WAS: NA-ME-E RC (<http://sds-was.aemet.es>)



The screenshot shows the website for the Northern Africa-Middle East-Europe (NA-ME-E) Regional Center of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS). The page features a header with the organization's name and logo, a navigation menu with options like Home, About Us, and Forecast & Products, and a main content area with a list of services. A search bar and a 'Latest News' section are also visible.

NORTHERN AFRICA-MIDDLE EAST-EUROPE (NA-ME-E) REGIONAL CENTER
WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)

FORECAST AND PRODUCTS

- Data exchange
- Joint visualization
- Common forecast evaluation
- Generation of multimodel products
- Calculation of monthly evaluation metrics
- New sources of data for model evaluation
- Sharing model output data files
- Time-averaged products

SDS-WAS: Dust models



LMD

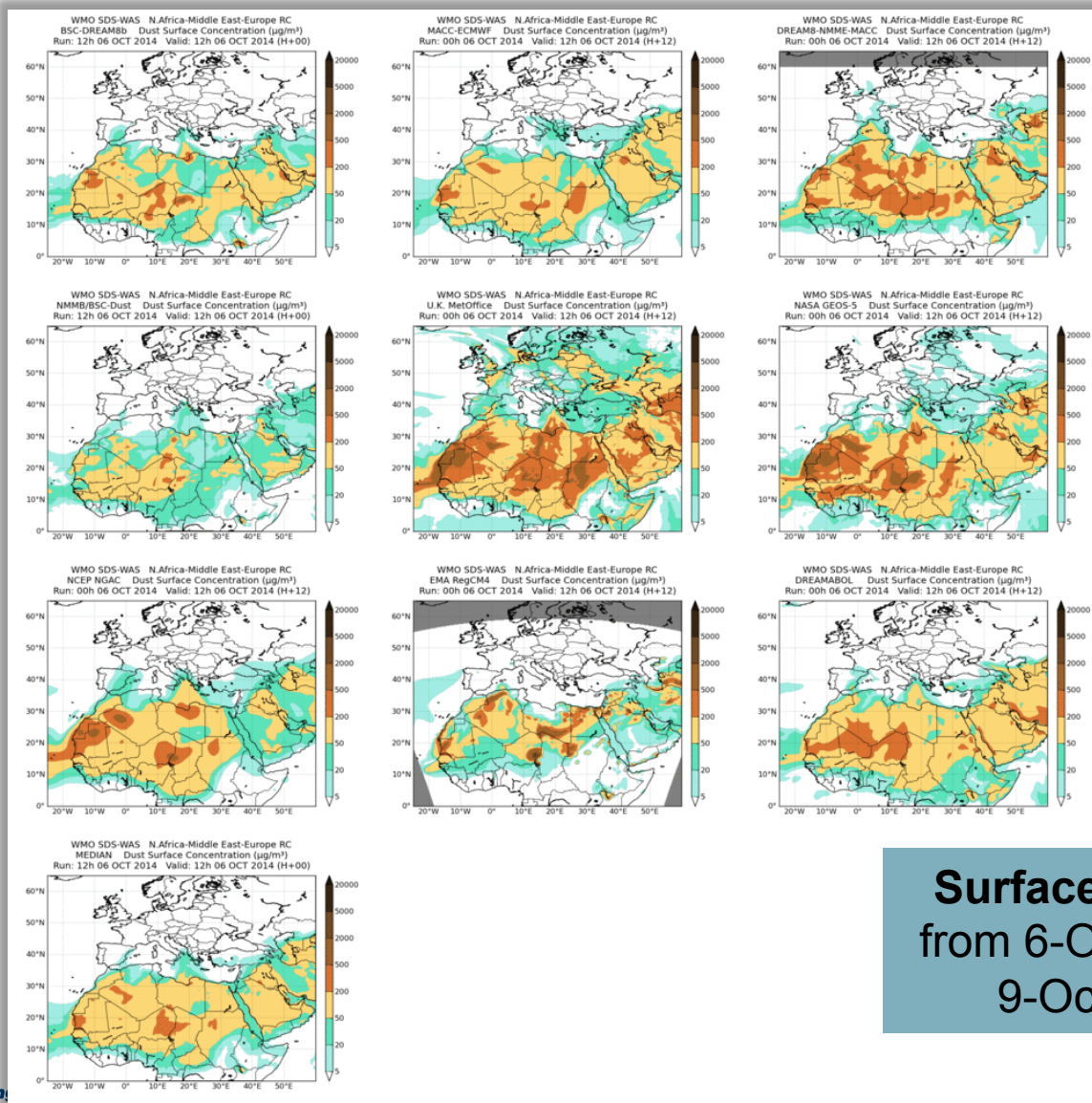


LSCE



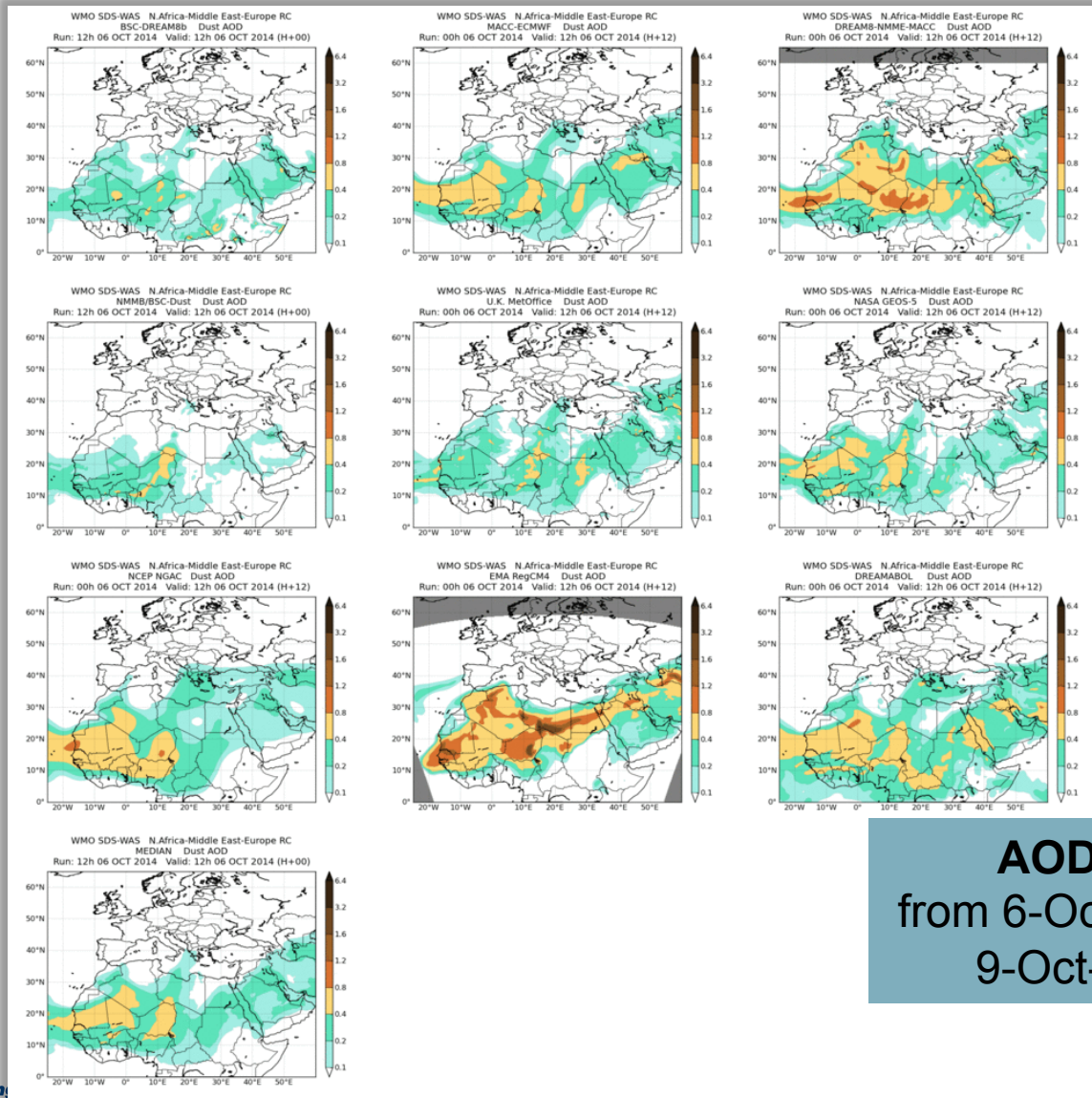
MODEL	RUN TIME	DOMAIN	DATA ASSIMILATION
BSC-DREAM8b	12	Regional	No
CHIMERE	00	Regional	No
LMDzT-INCA	00	Global	No
MACC	00	Global	MODIS AOD
DREAM-NMME-MACC	12	Regional	MACC analysis
NMMB/BSC-Dust	12	Regional	No
MetUM	00	Global	MODIS AOD
GEOS-5	00	Global	MODIS reflectances
NGAC	00	Global	No
EMA REG CM4	12	Regional	No
DREAMABOL	12	Regional	No

SDS-WAS: Surface concentration joint visualization



Surface concentration
from 6-Oct-2014 12:00 to
9-Oct-2014 00:00

SDS-WAS: AOD joint visualization

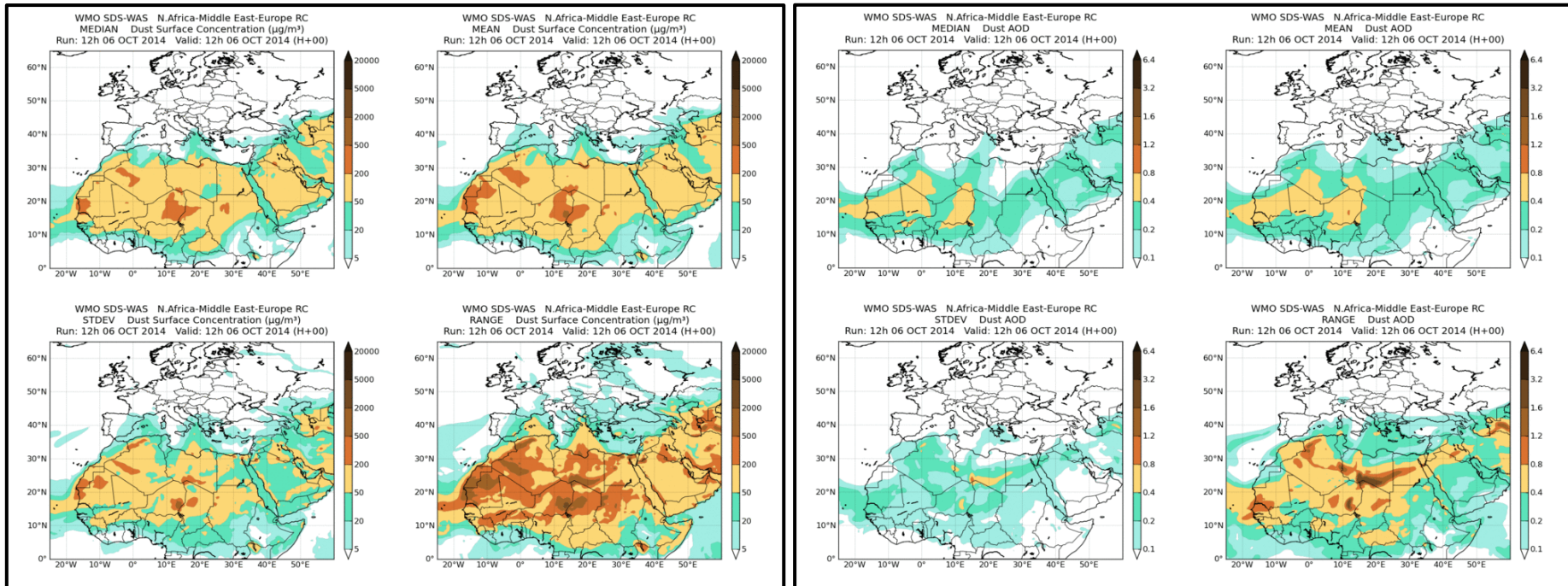


AOD at 550nm
from 6-Oct-2014 12:00 to
9-Oct-2014 00:00

SDS-WAS: Generation of multi-model products

Surface concentration

AOD at 550nm



from 6-Oct-2014 12:00 to 9-Oct-2014 00:00

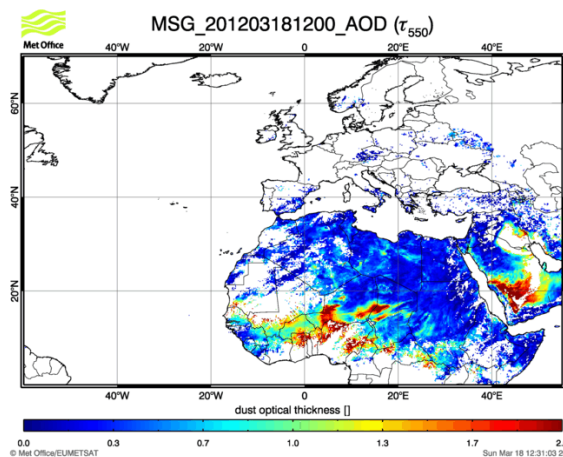
Model outputs are bi-linearly interpolated to a common $0.5^\circ \times 0.5^\circ$ grid mesh. Then, different multi-model products are generated:

CENTRALITY: median - mean

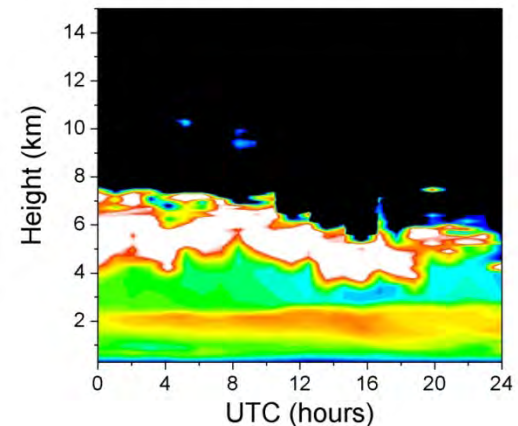
SPREAD: standard deviation – range of variation

New sources of data for model evaluation

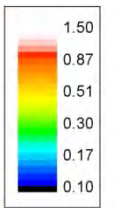
- Visibility
- MSG/SEVIRI
- MODIS
- OMI
- CALIPSO
- PARASOL
- MPLNET
- PM_{10}



Micro Pulse LIDAR - Sta. Cruz de Tenerife



08 Dec 2011



NO DATA

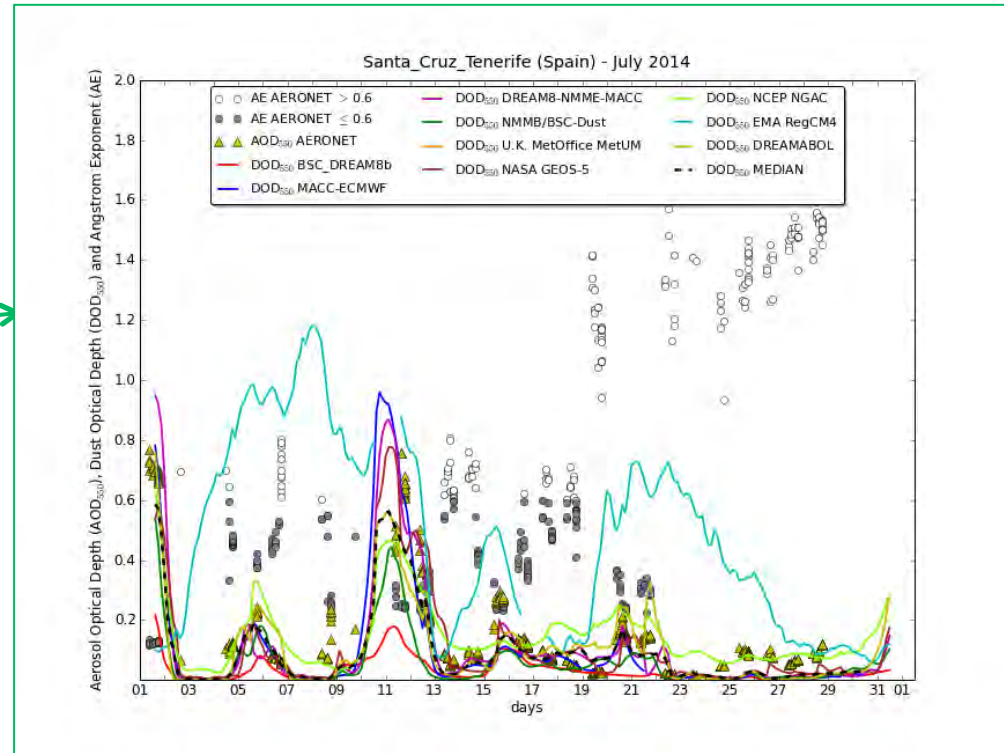
SDS-WAS: Model intercomparison

The screenshot displays the website for the Northern Africa-Middle East-Europe (NA-ME-E) Regional Center of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS). The page is titled "Northern Africa-Middle East-Europe (NA-ME-E) Regional Center Model Intercomparison" and is part of the MACC PROJECT. The breadcrumb trail shows: HOME > ABOUT US > FORECAST & PRODUCTS > PROJECTS & RESEARCH > MODEL INTERCOMPARISON > Northern Africa-Middle East-Europe (NA-ME-E) Regional Center Model Intercomparison.

The page features a navigation menu with links to HOME, ABOUT US, FORECAST & PRODUCTS, PROJECTS & RESEARCH, MATERIALS, NEWS, EVENTS, and CONTACT US. A search bar is located on the left side. The main content area includes a "Dust forecasts" section with a map of the region showing "Compared Dust Forecasts" and a "Forecast Evaluation" plot. The "Forecast Evaluation" plot is circled in red and shows a time series of dust concentration (µg/m³) for various models and observations from September 2012 to October 2012. The plot includes a legend with entries for "WMO SDS-WAS", "MOCAGE", "MIRAS", "MOCAGE-2", "MIRAS-2", "MOCAGE-3", "MIRAS-3", "MOCAGE-4", "MIRAS-4", "MOCAGE-5", "MIRAS-5", "MOCAGE-6", "MIRAS-6", "MOCAGE-7", "MIRAS-7", "MOCAGE-8", "MIRAS-8", "MOCAGE-9", "MIRAS-9", "MOCAGE-10", "MIRAS-10", "MOCAGE-11", "MIRAS-11", "MOCAGE-12", "MIRAS-12", "MOCAGE-13", "MIRAS-13", "MOCAGE-14", "MIRAS-14", "MOCAGE-15", "MIRAS-15", "MOCAGE-16", "MIRAS-16", "MOCAGE-17", "MIRAS-17", "MOCAGE-18", "MIRAS-18", "MOCAGE-19", "MIRAS-19", "MOCAGE-20", "MIRAS-20", "MOCAGE-21", "MIRAS-21", "MOCAGE-22", "MIRAS-22", "MOCAGE-23", "MIRAS-23", "MOCAGE-24", "MIRAS-24", "MOCAGE-25", "MIRAS-25", "MOCAGE-26", "MIRAS-26", "MOCAGE-27", "MIRAS-27", "MOCAGE-28", "MIRAS-28", "MOCAGE-29", "MIRAS-29", "MOCAGE-30", "MIRAS-30", "MOCAGE-31", "MIRAS-31", "MOCAGE-32", "MIRAS-32", "MOCAGE-33", "MIRAS-33", "MOCAGE-34", "MIRAS-34", "MOCAGE-35", "MIRAS-35", "MOCAGE-36", "MIRAS-36", "MOCAGE-37", "MIRAS-37", "MOCAGE-38", "MIRAS-38", "MOCAGE-39", "MIRAS-39", "MOCAGE-40", "MIRAS-40", "MOCAGE-41", "MIRAS-41", "MOCAGE-42", "MIRAS-42", "MOCAGE-43", "MIRAS-43", "MOCAGE-44", "MIRAS-44", "MOCAGE-45", "MIRAS-45", "MOCAGE-46", "MIRAS-46", "MOCAGE-47", "MIRAS-47", "MOCAGE-48", "MIRAS-48", "MOCAGE-49", "MIRAS-49", "MOCAGE-50", "MIRAS-50", "MOCAGE-51", "MIRAS-51", "MOCAGE-52", "MIRAS-52", "MOCAGE-53", "MIRAS-53", "MOCAGE-54", "MIRAS-54", "MOCAGE-55", "MIRAS-55", "MOCAGE-56", "MIRAS-56", "MOCAGE-57", "MIRAS-57", "MOCAGE-58", "MIRAS-58", "MOCAGE-59", "MIRAS-59", "MOCAGE-60", "MIRAS-60", "MOCAGE-61", "MIRAS-61", "MOCAGE-62", "MIRAS-62", "MOCAGE-63", "MIRAS-63", "MOCAGE-64", "MIRAS-64", "MOCAGE-65", "MIRAS-65", "MOCAGE-66", "MIRAS-66", "MOCAGE-67", "MIRAS-67", "MOCAGE-68", "MIRAS-68", "MOCAGE-69", "MIRAS-69", "MOCAGE-70", "MIRAS-70", "MOCAGE-71", "MIRAS-71", "MOCAGE-72", "MIRAS-72", "MOCAGE-73", "MIRAS-73", "MOCAGE-74", "MIRAS-74", "MOCAGE-75", "MIRAS-75", "MOCAGE-76", "MIRAS-76", "MOCAGE-77", "MIRAS-77", "MOCAGE-78", "MIRAS-78", "MOCAGE-79", "MIRAS-79", "MOCAGE-80", "MIRAS-80", "MOCAGE-81", "MIRAS-81", "MOCAGE-82", "MIRAS-82", "MOCAGE-83", "MIRAS-83", "MOCAGE-84", "MIRAS-84", "MOCAGE-85", "MIRAS-85", "MOCAGE-86", "MIRAS-86", "MOCAGE-87", "MIRAS-87", "MOCAGE-88", "MIRAS-88", "MOCAGE-89", "MIRAS-89", "MOCAGE-90", "MIRAS-90", "MOCAGE-91", "MIRAS-91", "MOCAGE-92", "MIRAS-92", "MOCAGE-93", "MIRAS-93", "MOCAGE-94", "MIRAS-94", "MOCAGE-95", "MIRAS-95", "MOCAGE-96", "MIRAS-96", "MOCAGE-97", "MIRAS-97", "MOCAGE-98", "MIRAS-98", "MOCAGE-99", "MIRAS-99", "MOCAGE-100", "MIRAS-100".

Other sections on the page include "Outstanding" (with links to lectures and guidance), "Subscribe to the Public Newsletter!" (with a form for Full Name and Your email), and "Dust observations" (with a small map of the region).

SDS-WAS: NRT Evaluation using AERONET



Model evaluation metrics (bias, correlation, RMSE and FGE) are calculated for AERONET observations with $AE \leq 0.6$:

- By regions: NA-ME-E, Sahel/Sahara, Middle East and Mediterranean
- By time periods: monthly, seasonal and annual

SDS-WAS: NRT Evaluation using AERONET

You are here: Home > Forecast & Products > Forecast evaluation > Model evaluation metrics. Annual scores

Model evaluation metrics. Annual scores

by Francesco Benincasa — last modified Jun 25, 2013 10:34 AM

Date:

Jan 2013 - Dec 2013. Dust Optical Depth.
Threshold Angstrom Exponent = 0.600

BIAS

	BSC_ DREAM8b	MACC- ECMWF	DREAMB- NMME-MACC	NMMB/ BSC-Dust	U.K. Met Office	NASA GEOS-5	NCEP NGAC	MEDIAN
Sahel/Sahara show stations	-0.19	-0.10	-0.04	-0.12	-0.06	-0.11	0.00	-0.10
Middle East show stations	-0.19	-0.11	0.00	-0.24	-0.06	-0.18	-0.16	-0.16
Mediterranean show stations	-0.15	-0.13	-0.08	-0.17	-0.09	-0.15	-0.07	-0.13
TOTAL	-0.18	-0.11	-0.05	-0.15	-0.07	-0.13	-0.04	-0.12

ROOT MEAN SQUARE ERROR

	BSC_ DREAM8b	MACC- ECMWF	DREAMB- NMME-MACC	NMMB/ BSC-Dust	U.K. Met Office	NASA GEOS-5	NCEP NGAC	MEDIAN
Sahel/Sahara show stations	0.38	0.34	0.34	0.35	0.33	0.33	0.31	0.32

A set of evaluation metrics are selected:

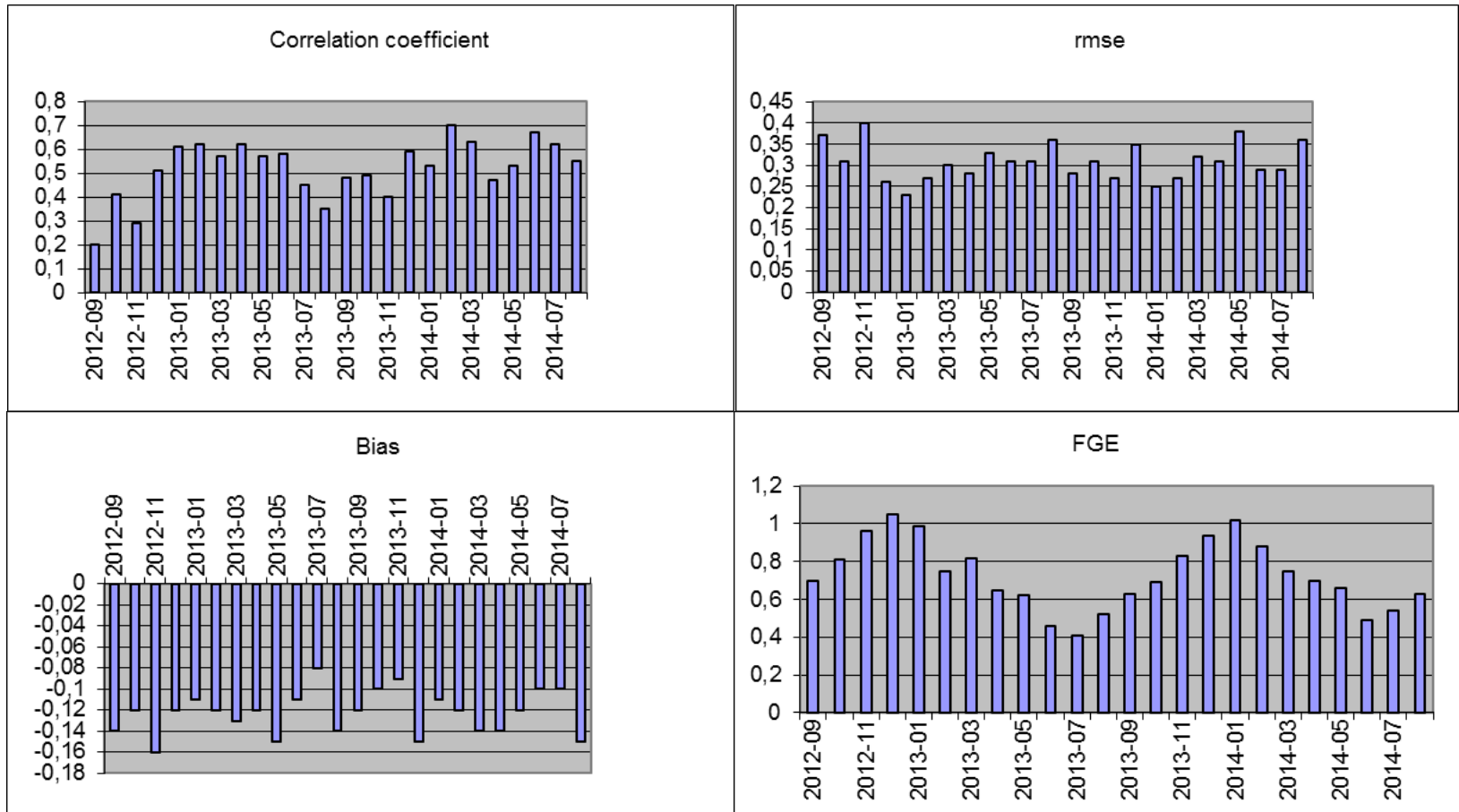
- Bias
- RMSE
- correlation coefficient
- FGE

Calculations evaluation metrics are done for:

- monthly/seasonal/annual
- sites and regions



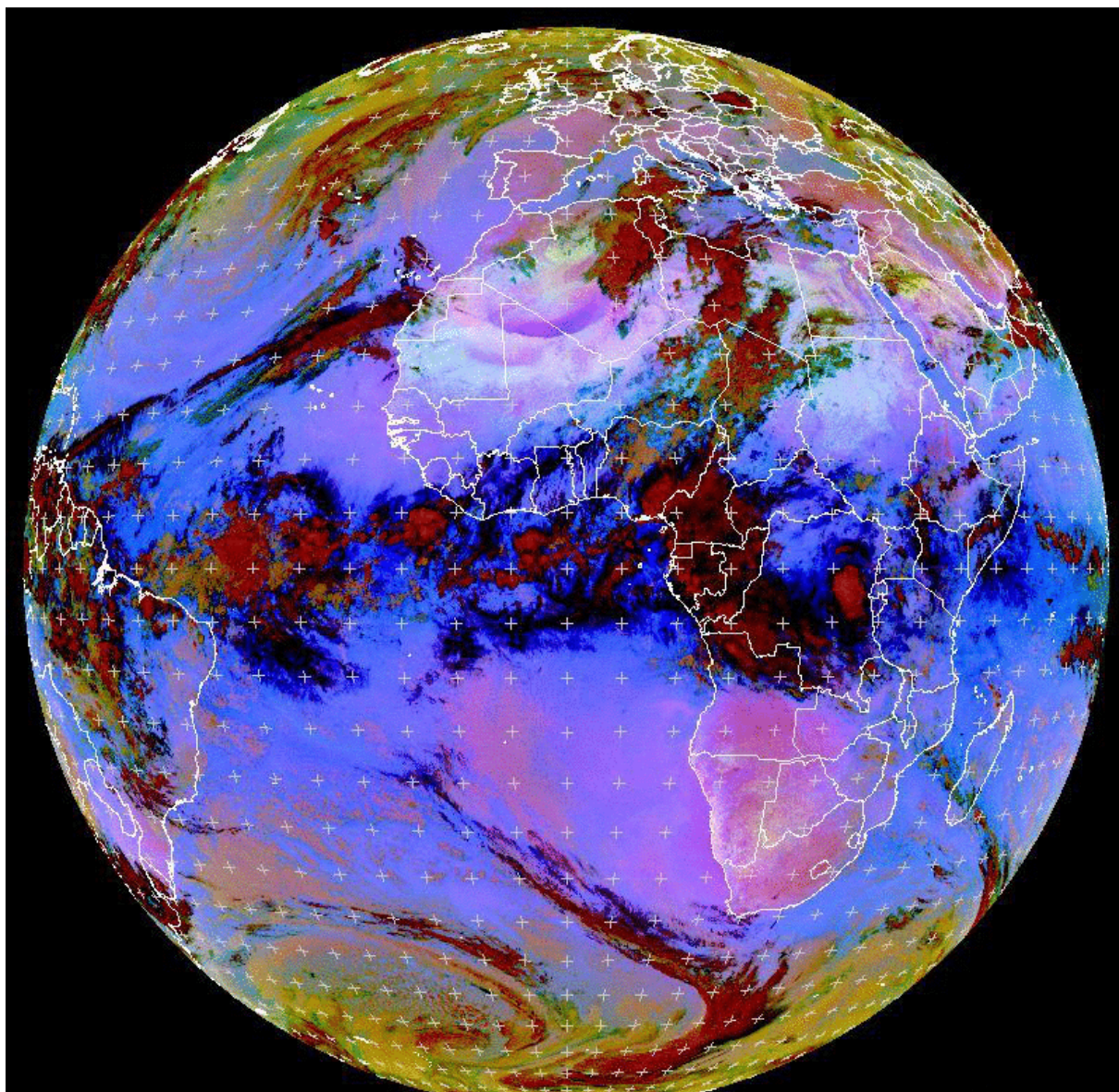
SDS-WAS: Multi-model product evaluation using AERONET



SDS-WAS: Multi-model product evaluation using AERONET

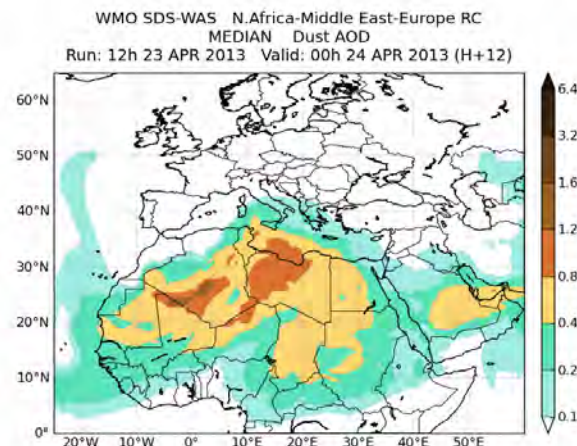
Period	Region	Mean Bias	Root Mean Square Error	Correlation coefficient	Fractional Gross Error	Number of cases
Autumn 2012	Sahara-Sahel	-0,12	0,37	0,37	0,61	1523
	Mediterranean	-0,16	0,36	0,06	1,13	1066
Winter 2013	Sahara-Sahel	-0,11	0,25	0,69	0,65	1610
	Mediterranean	-0,13	0,27	0,34	1,40	1051
Spring 2013	Sahara-Sahel	-0,10	0,28	0,68	0,56	2332
	Mediterranean	-0,15	0,32	0,41	0,96	1650
Summer 2013	Sahara-Sahel	-0,10	0,36	0,47	0,41	2483
	Mediterranean	-0,09	0,20	0,44	0,61	808
Autumn 2013	Sahara-Sahel	-0,09	0,31	0,52	0,52	1929
	Mediterranean	-0,12	0,27	0,20	1,12	987
Winter 2014	Sahara-Sahel	-0,11	0,30	0,69	0,65	1710
	Mediterranean	-0,14	0,26	0,28	1,51	921
Spring 2014	Sahara-Sahel	-0,12	0,34	0,58	0,29	2280
	Mediterranean	-0,14	0,31	0,52	0,91	1426
Summer 2014	Sahara-Sahel	-0,12	0,37	0,56	0,41	1885
	Mediterranean	-0,11	0,18	0,72	0,75	1164

SDS-WAS: NRT Evaluation using satellite aerosol products



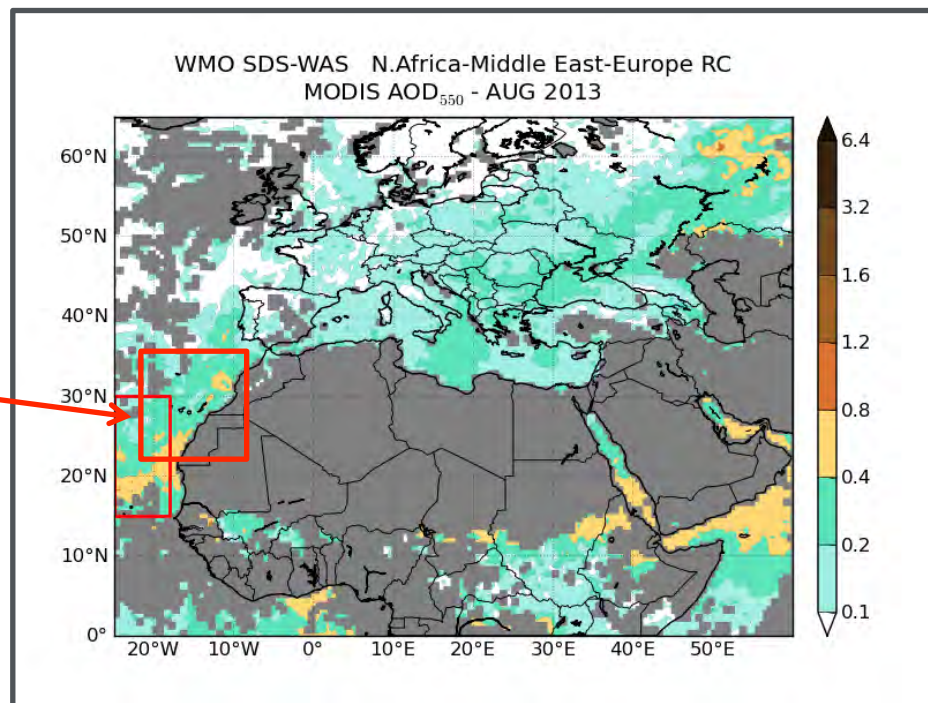
MET10 RGB-Dust 2013-04-24 00:00 UTC

24 April 2013



SDS-WAS: NRT Evaluation using MODIS

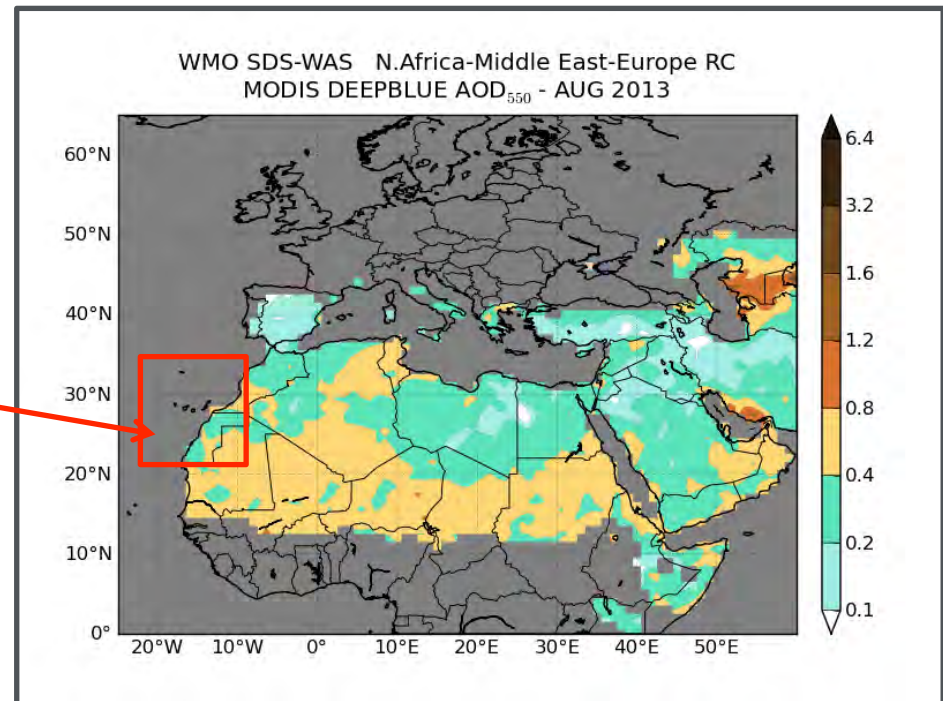
19th August 2013



	BIAS	ROOT MEAN SQUARE ERROR	CORRELATION COEFFICIENT	FRACTIONAL GROSS ERROR	NUMBER OF CASES
BSC_ DREAM8b	-0.16	0.21	0.70	0.87	1220
NMMB/BSC- Dust	-0.13	0.20	0.68	0.81	1038
NCEP NGAC	0.14	0.21	0.78	0.41	1228

SDS-WAS: NRT Evaluation using MODIS Deep Blue

19th August 2013



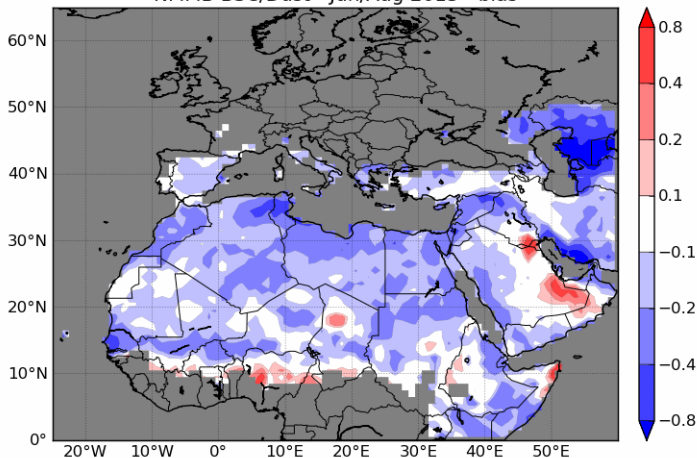
	BIAS	ROOT MEAN SQUARE ERROR	CORRELATION COEFFICIENT	FRACTIONAL GROSS ERROR	NUMBER OF CASES
BSC_ DREAM8b	-0.17	0.31	0.28	0.96	42618
NMMB/BSC- Dust	-0.20	0.33	0.29	1.05	41049
NCEP NGAC	-0.06	0.29	0.32	0.64	42664

SDS-WAS: NRT Evaluation using MODIS Deep Blue

MB

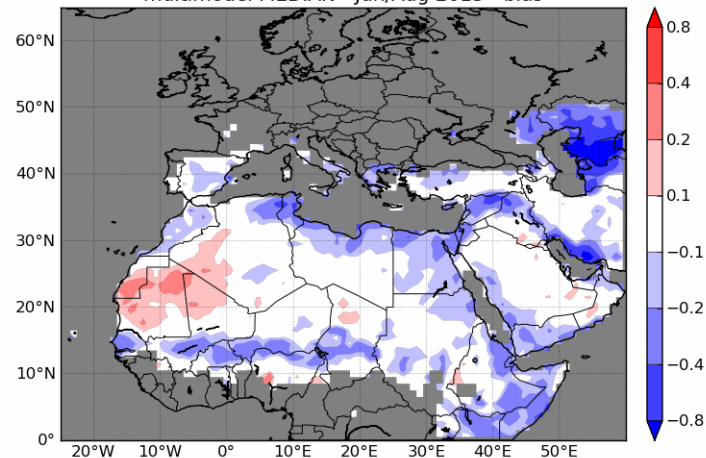
NMMB-BSC/Dust

WMO SDS-WAS N.Africa-Middle East-Europe RC
NMMB-BSC/Dust - Jun/Aug 2013 - bias

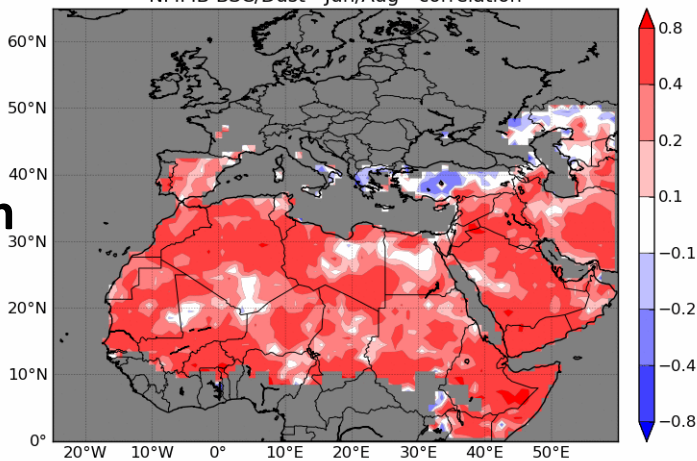


Multimodel MEDIAN

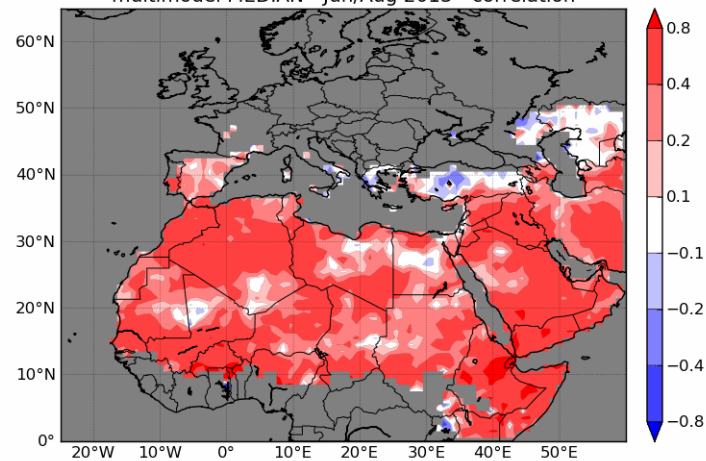
WMO SDS-WAS N.Africa-Middle East-Europe RC
multimodel MEDIAN - Jun/Aug 2013 - bias



WMO SDS-WAS N.Africa-Middle East-Europe RC
NMMB-BSC/Dust - Jun/Aug - correlation



WMO SDS-WAS N.Africa-Middle East-Europe RC
multimodel MEDIAN - Jun/Aug 2013 - correlation

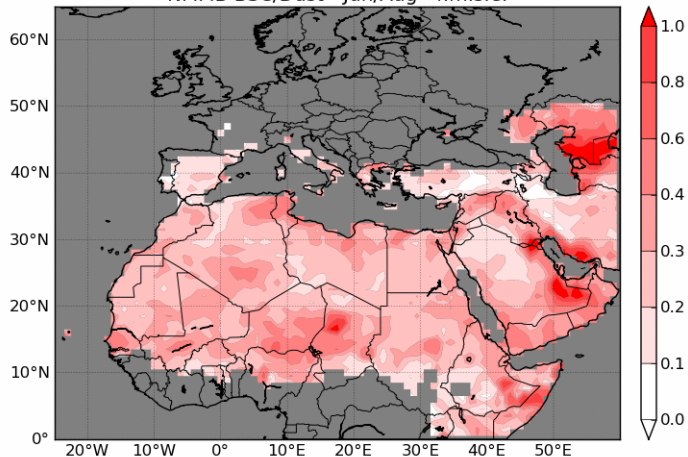


Correlation

SDS-WAS: NRT Evaluation using MODIS Deep Blue

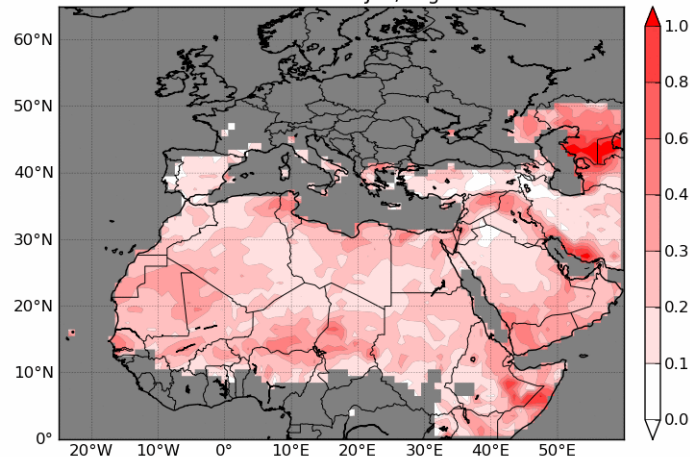
NMMB-BSC/Dust

WMO SDS-WAS N.Africa-Middle East-Europe RC
NMMB-BSC/Dust - Jun/Aug - r.m.s.e.



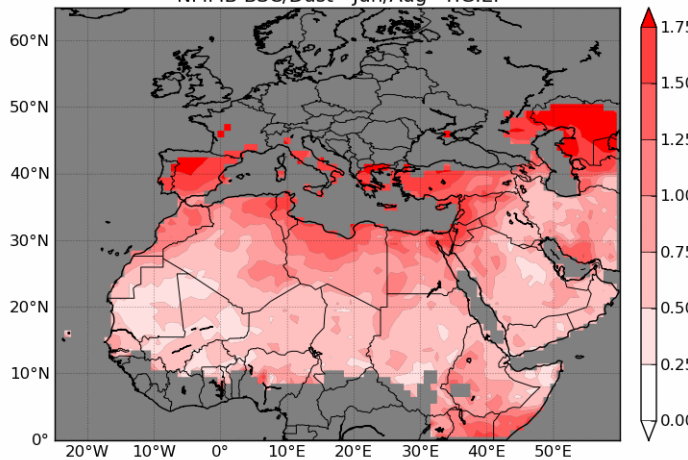
Multimodel MEDIAN

WMO SDS-WAS N.Africa-Middle East-Europe RC
multimodel MEDIAN - Jun/Aug - r.m.s.e.

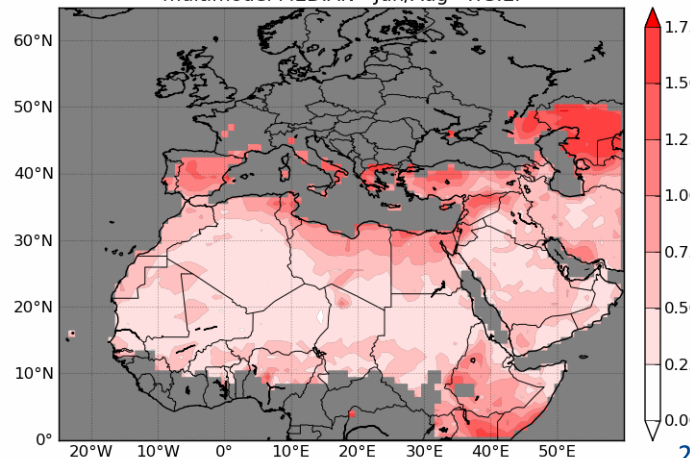


RMSE

WMO SDS-WAS N.Africa-Middle East-Europe RC
NMMB-BSC/Dust - Jun/Aug - F.G.E.



WMO SDS-WAS N.Africa-Middle East-Europe RC
multimodel MEDIAN - Jun/Aug - F.G.E.



FGE

SDS-WAS: Evaluation using VISIBILITY data

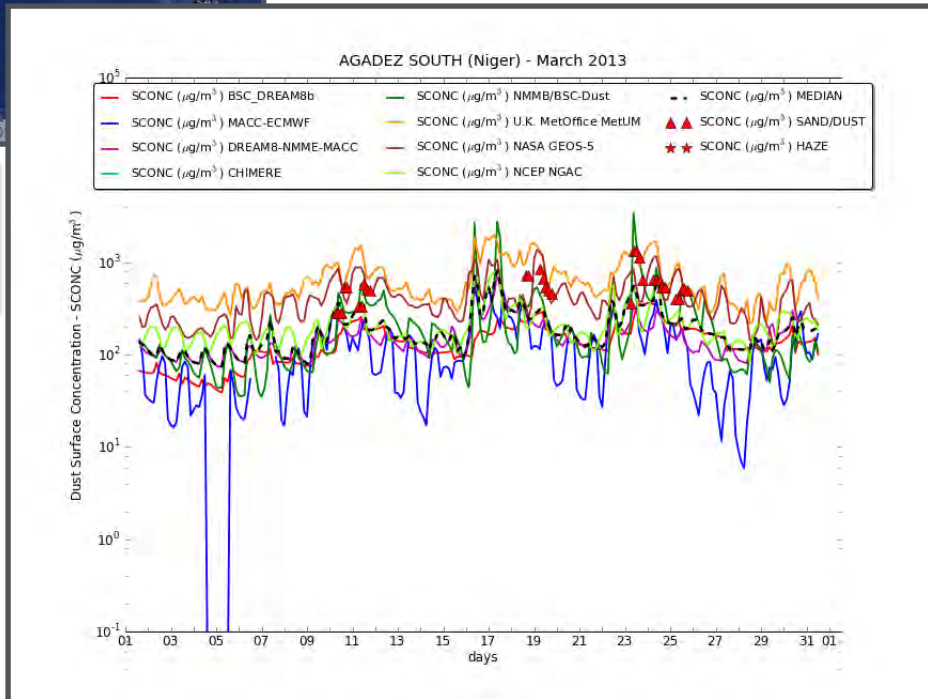


AGADEZ SOUTH, Niger
March 2013








PM10 = 1339.84 V^{-0.67}
Ben Mohamed et al. (1992)



PM10 = 1772.24 V^{-1.1}
Camino et al., submitted to Aeolian Research



SDS-WAS: Files download

BSC-DREAM8b v2.0	DOWNLOAD FILES	Model website	
MACC-ECMWF	DOWNLOAD FILES	Model website	
DREAM-NMME-MACC	DOWNLOAD FILES	Model website	
NMMB/BSC-Dust	DOWNLOAD FILES	Model website	
NASA-GEOS-5	DOWNLOAD FILES	Model website	
NCEP-NGAC	DOWNLOAD FILES	Model website	
Multimodel			

Title	Size	Modified
latest - <i>(download all)</i>	4.0 kB	Apr 18, 2013 09:00 PM
2013 - <i>(download all)</i>	4.0 kB	Apr 01, 2013 09:00 PM
2012 - <i>(download all)</i>	4.0 kB	Apr 08, 2013 04:30 PM

- Daily forecasts of dust surface concentration and dust optical depth will be displayed on a page together with a menu to allow visualization of the archived products and/or download of the numerical files for a selected range of dates.
- Access to the download pages shall be restricted to those groups that authorize the exchange of their own data.



SDS-WAS: Model intercomparison

The screenshot shows the website for the Northern Africa-Middle East-Europe (NA-ME-E) Regional Center of the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS). The page features a navigation menu with categories: HOME, ABOUT US, FORECAST & PRODUCTS, PROJECTS & RESEARCH, MATERIALS, NEWS, EVENTS, and CONTACT US. The 'PROJECTS & RESEARCH' menu is expanded, showing sub-items: MACC PROJECTS, MODEL INTERCOMPARISON, WEST ASIA REGIONAL PROGRAM, ICAP, DIAPASON, and SDS-WAS STUDIES. The 'SDS-WAS STUDIES' item is circled in red. Below the menu, a search bar and a 'Latest News' section are visible. The 'Latest News' section includes a link to a book release: 'The book "Mineral Dust - A key player in the Earth system" has been released' dated Sep 08, 2014. The main content area displays a satellite image of a dust storm over Europe, with a red circle highlighting the 'SDS-WAS STUDIES' link in the navigation menu. The text below the image discusses a model intercomparison study of a Saharan dust outbreak in April 2011, mentioning authors Huneus et al. (2014) and Basart et al. (2012).

Log in Register

NORTHERN AFRICA-MIDDLE EAST-EUROPE (NA-ME-E) REGIONAL CENTER

WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)

WMO SDS WAS | Asia Regional Center

- HOME
- ABOUT US
- FORECAST & PRODUCTS
- PROJECTS & RESEARCH
- MATERIALS
- NEWS
- EVENTS
- CONTACT US

You are here: Home > Projects & Research > SDS-WAS STUDIES

SDS-WAS STUDIES

by Enric Terradellas

Forecasting the North African dust outbreak towards Europe occurred in April 2011

Four state-of-the-art dust forecast models are examined to assess their performance to predict up to 72 hours ahead an intense Saharan dust outbreak over Western Europe up to Scandinavia between 5th and 11th April 2011. The capacity of the models to predict the evolution of the dust cloud is assessed by comparing their results with aerosol optical depth from AERONET and MODIS, as well as with dust surface concentration from air-quality monitoring stations. In addition, the CALIOP vertical profiles of extinction are used to examine the predicted vertical dust distribution of each model. To identify possible reasons for the different model performance, the wind fields yield by the simulations are evaluated with 10-m winds observed at meteorological stations and the vertical wind profiles from two radio sounding stations in the source region.

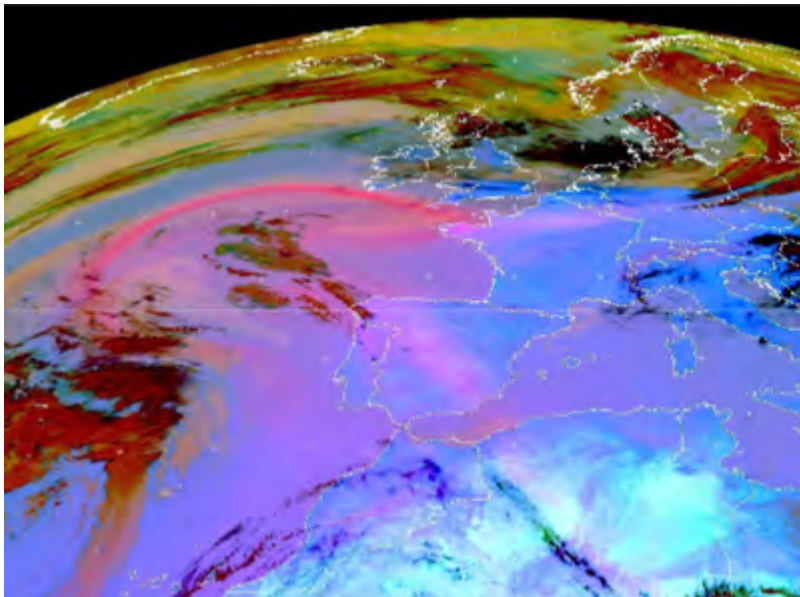
Huneus, N. et al. (2014): Forecasting the North African dust outbreak towards Europe in april 2011: A model intercomparison. MACC II Open Science Conference, Brussels

Basart, S. et al. (2012): Dust forecast model intercomparison: Case study of the dust cloud of April 2011. 24th ACCENT/GLOREAM Workshop, Barcelona

Contact: Nicolás Huneus (nhuneus@dnf.uchile.cl)

sds-was.aemet.es/projects-research

SDS-WAS: Model intercomparison April 2011



*MSG/SEVIRI RGB product 7 April
Courtesy of EUMETSAT*

- The selected dust event corresponds to the one which occurred between the 5th and 11th of April of 2011.
- Participating models: BSC-DREAM8b, NMMB/BSC-Dust, ECMWF-MACC, UKMetOffice-UM and NMME-DREAM-MACC
- Comparison of each forecast (at 24, 48 and 72h) output to in-situ measurements of AOD (from AERONET), surface concentration (PM) and satellite retrieved AOD (MODIS, CALIPSO) and meteorology.

(Huneus et al., in preparation)

Contact: Nicolás Huneus (nhuneus@dgf.uchile.cl)

SDS-WAS: Lidar and models intercomparison



69 dust cases between Jan 2011 – Jun 2013



BSC-DREAM8b v2
NMMB-BSC/Dust



DREAM8-NMME-MACC



BOLCHEM

SDS-WAS: Study of a haboob in Iran



Case study of the small-scale extreme dust storm occurred in **Tehran** on **2nd June 2014**, at 5:30 PM local time, lasting less than 2 hours according to public evidence.

Based on public news, the dust storm caused several deaths, reduction of visibility to several tenths meters in the city, and adverse disturbance of the public traffic. The blowing wind reached 110 km/h.

Contact: Slobodan Nickovic (nickovic@gmail.com)

Barcelona Dust Forecast Center (<http://dust.aemet.es/>)

*First Specialized Center for Mineral Dust Prediction of WMO
NMMB/BSC-CTM selected to provide operational forecasts at ~10km*

The screenshot shows the website's header with the title "BARCELONA DUST FORECAST CENTER" and logos for AEMet, BSC, and WMO. A navigation menu includes links for HOME, FORECAST, EVALUATION, OTHER PRODUCTS, METHODS, NEWS, EVENTS, ABOUT US, and CONTACT. A newsletter sign-up form is on the left, and a featured article about WMO Global Telecommunications System is in the center. At the bottom, there is a dust forecast map for Northern Africa, Middle East, and Europe.

BARCELONA DUST FORECAST CENTER

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WMO SDS-WAS || NA-ME-E Regional Center

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Dust forecasts available on the WMO Global Telecommunications System

The forecasts published on this web portal are also available on the Global Telecommunications System of the World Meteorological Organization (WMO)

[Read More](#)

World Meteorological

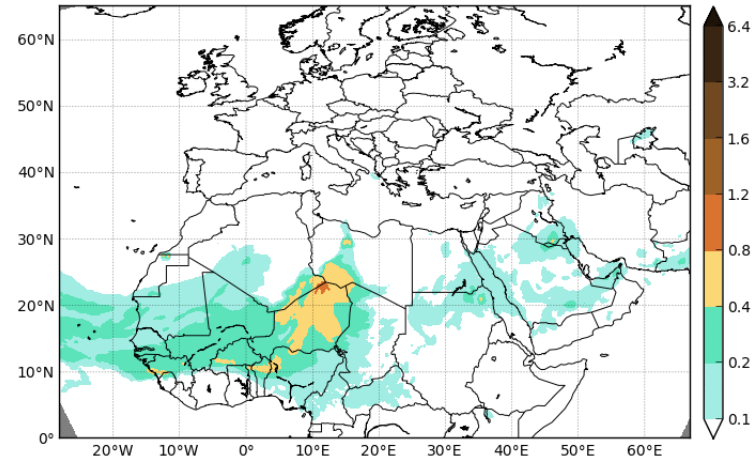
Barcelona Dust Forecast Center
NMMB/BSC-Dust Res:0.1°x0.1° Dust Surface Conc. (µg/m³)
Run: 12h 06 OCT 2014 Valid: 00h 07 OCT 2014 (H+12)

Dust forecast

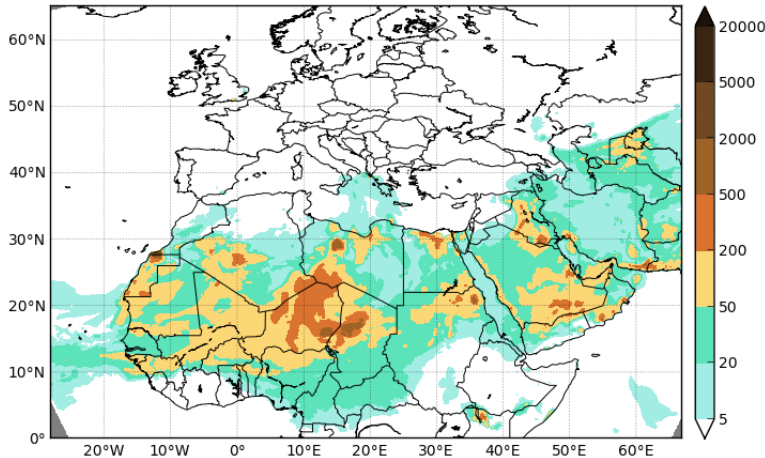
Latest dust forecast for Northern Africa, Middle East and Europe

- Dust Optical Depth at 550nm**
- Dust Dry Deposition**
- Dust Load**
- Dust Surface Concentration**
- Dust Surface Extinction at 550nm**
- Dust Wet Deposition**

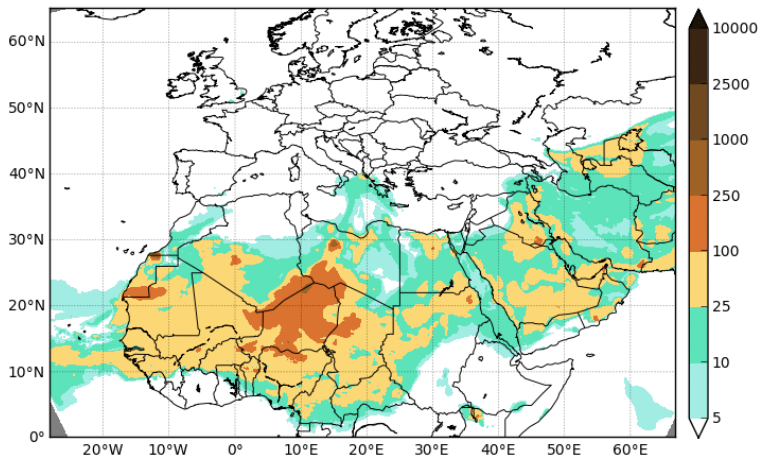
Barcelona Dust Forecast Center
NMMB/BSC-Dust Res:0.1°x0.1° Dust AOD
Run: 12h 06 OCT 2014 Valid: 12h 06 OCT 2014 (H+00)



Barcelona Dust Forecast Center
NMMB/BSC-Dust Res:0.1°x0.1° Dust Surface Conc. ($\mu\text{g}/\text{m}^3$)
Run: 12h 06 OCT 2014 Valid: 12h 06 OCT 2014 (H+00)



Barcelona Dust Forecast Center
NMMB/BSC-Dust Res:0.1°x0.1° Dust Surface Ext. (Mm^{-1})
Run: 12h 06 OCT 2014 Valid: 12h 06 OCT 2014 (H+00)



BDFC : NRT Evaluation using AERONET



Monthly scores

Date 2014-09

Methods: AERONET-based scores

Sep 2014. Dust Optical Depth.
Threshold Angstrom Exponent = 0.600

	BIAS	ROOT MEAN SQUARE ERROR	CORRELATION COEFFICIENT	FRACTIONAL GROSS ERROR	NUMBER OF CASES
Sahel/Sahara show stations	-0.23	0.35	0.39	1.00	550
Middle East show stations	-0.17	0.18	0.30	0.91	19
Mediterranean show stations	-0.26	0.33	0.27	1.50	414
TOTAL	-0.24	0.34	0.36	1.21	983

A set of evaluation metrics are selected:

- Bias
- RMSE
- correlation coefficient
- FGE

Calculations evaluation metrics are done for:

- monthly/seasonal/annual
- sites and regions

Next Dust events

4th Training Course on WMO SDS-WAS products *17-20 November 2014, Casablanca, Morocco*



welcome you to Casablanca, Morocco, for the '*4th Training Course on WMO SDS-WAS products (satellite and ground observation and modelling of atmospheric dust)*' to be held 17-20 November 2014.

The local organizer of the event is the National Meteorology Direction

The course coordinators are SDS-WAS. Regional Center for Northern Africa, Middle East and Europe and Barcelona Dust Forecast Center

More information at:

<http://sds-was.aemet.es/events/4th-training-course-on-wmo-sds-was-products>



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Thank you!

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