



WMO

# World Meteorological Organization

Working together in weather, climate and water

## WMO Sand and Dust Storm Warning Advisory and Assessment System

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# WMO-WWRP/GAW Sand and Dust Storm Warning Advisory and Assessment System SDS-WAS

## Mission

To enhance the ability of countries to deliver timely and quality sand and dust storm forecasts, observations, *information and knowledge* to users through an international partnership of research and operational communities



# Why SDS-WAS

- **Human Health** (asthma, infections, meningitis in Africa, valley fever in the America's)
- **Agriculture** (negative & positive impacts)
- **Marine productivity**
- **Aviation** ( air disasters)
- **Ground Transportation**
- **Industry** (Semi-conductor, Tourism, etc)



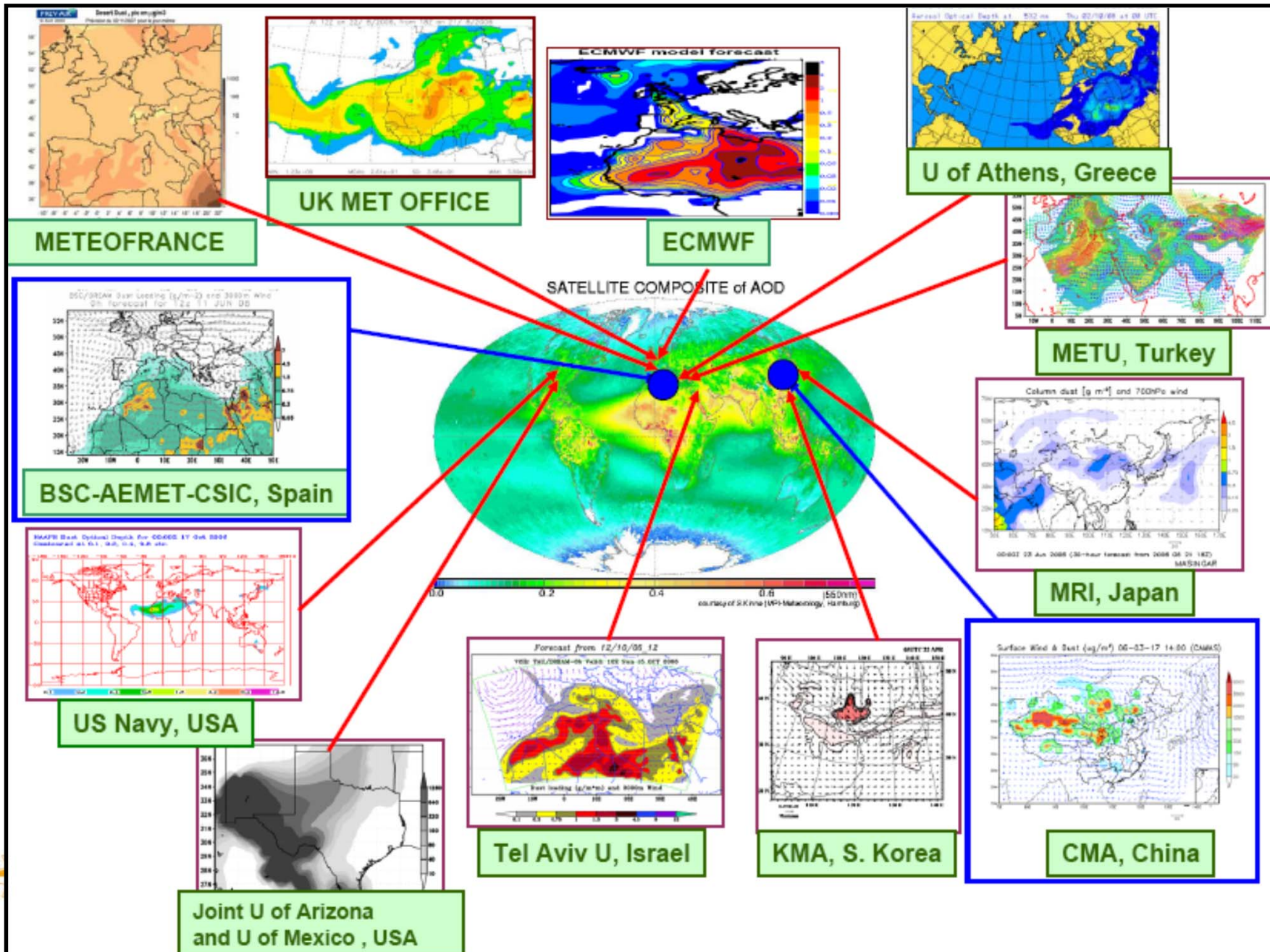


# Brief SDS-WAS history

- 2004:** Beijing, China: International Symposium on SDS & a WMO Experts **Workshop** on SDS.
- **2005:** More than 40 Member countries indicated interest to cooperate in SDS-WAS.
  - **2007:** the 14th WMO Congress endorsed launching of the SDS-WAS.
  - **2008:** the 60th EC of WMO welcomed the establishment of the two SDS-WAS regional centres in China and Spain in support of the corresponding SDS-WAS nodes.
  - **2009-2015:** A series of workshops within the SDS-WAS in: Barcelona (Spain), Niamey (Niger), Ankara (Turkey), Antalya (Turkey), Tsukuba (Japan), Seoul (Korea), Teheran (Iran), Belgrade (Serbia), Kuwait City (Kuwait), Manama (Bahrain), Castellaneta Marina (Italy), Casablanca (Morocco), ...
  - **2014:** Opening the Barcelona Dust Forecast Centre - 1<sup>st</sup> WMO Operational Dust Prediction Centre



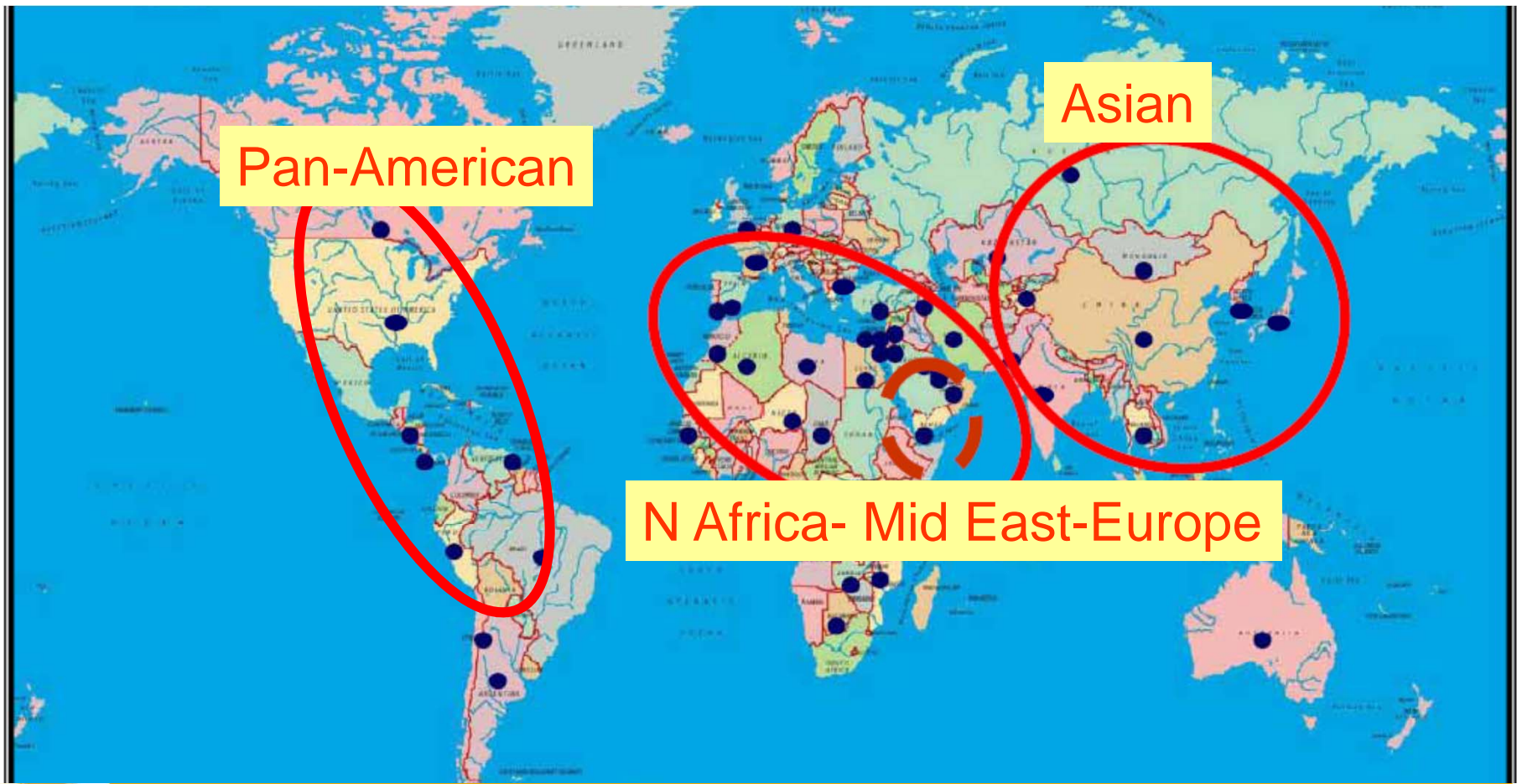
# Dust forecasting systems





# SDS-WAS Activity Nodes:

- 3 Regional Nodes, 15 organizations providing forecast
- WMO WWRP/GAW Global Coordination: Steering Committee and Trust Fund
- Regional coordination through regional activity nodes
- SDS-WAS Science & Implementation Plan approved

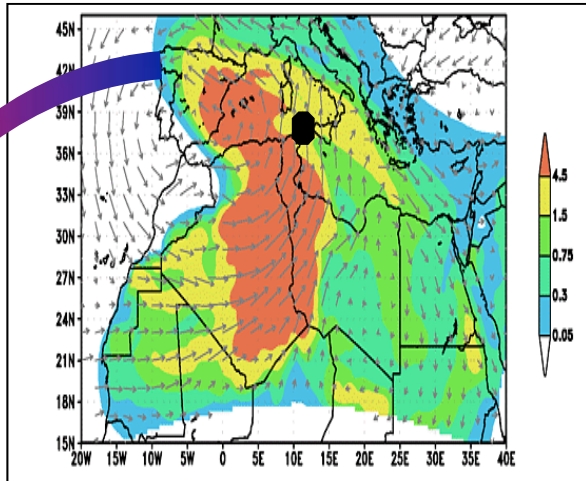




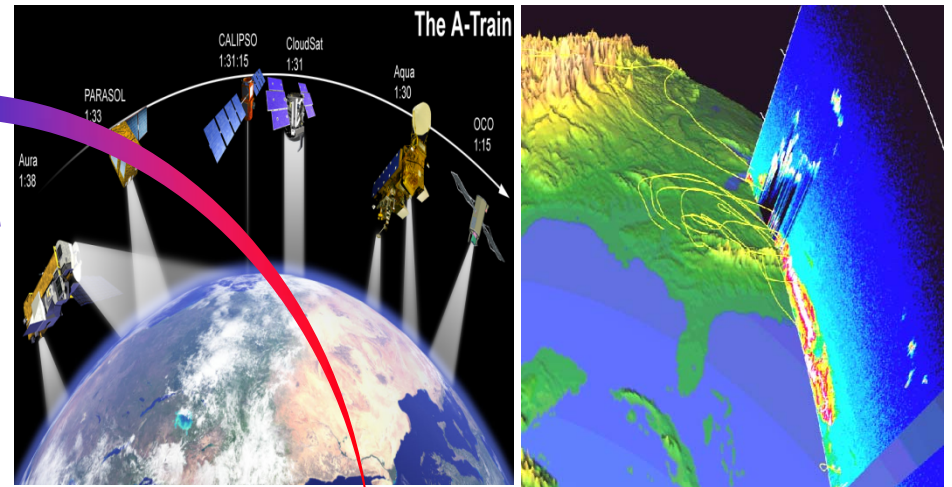
# WMO Supported Aerosol and Weather Prediction Research

## Forecast Models

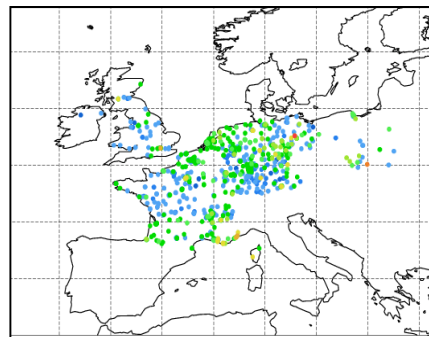
## System Components:



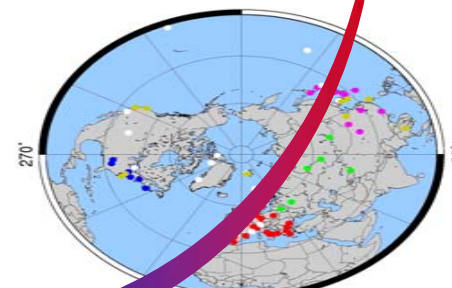
18 UTC, 7 May 2012 30-hr forecast



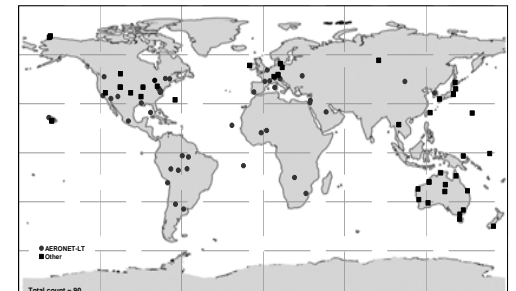
NASA A-Train MODIS CALIPSO & Geostationary Satellite IR Obs



European PM10



GALION Surface-based LIDAR



GAW/AERONET/SKYNET Surface-based AOD

# SDS-WAS Research and Development activities - Highlights 2015

## Science and Implementation Plan 2015-2020

- Accepted by SSC7
- Trust Fund requested
- Research plan updated



WMO/WWRP

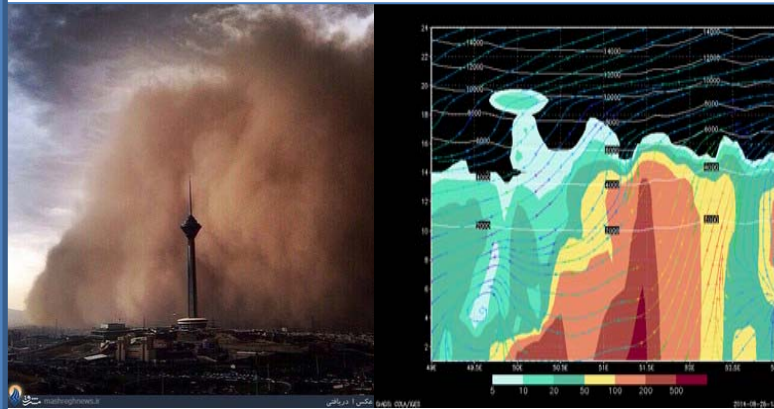
SAND AND DUST STORM  
WARNING ADVISORY AND ASSESSMENT SYSTEM (SDS-WAS)

TECHNICAL REPORT ON ASIAN REGIONAL CENTRE

By China, Japan and Korea  
in collaboration with  
Mongolia and Kazakhstan

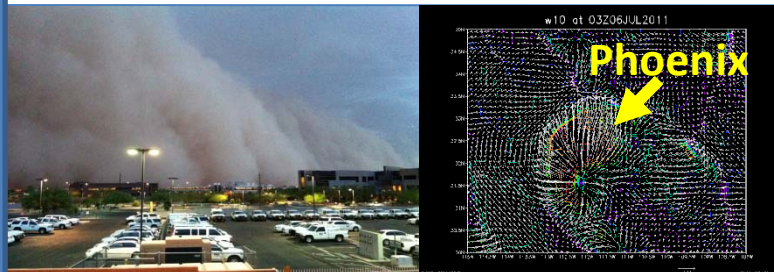
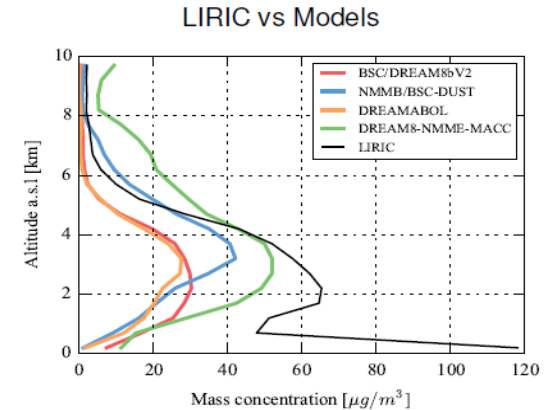
March 2015

## High resolution modelling



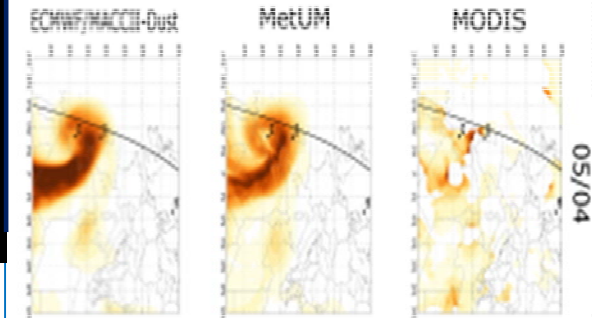
Tehran June 2014 SDS

## Models vs. lidars (GALION)

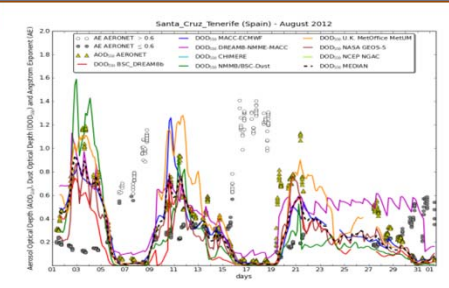
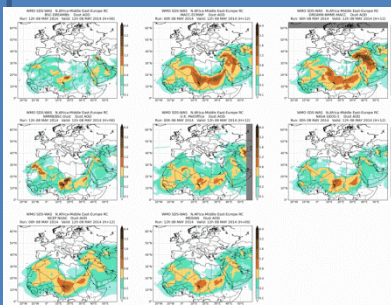
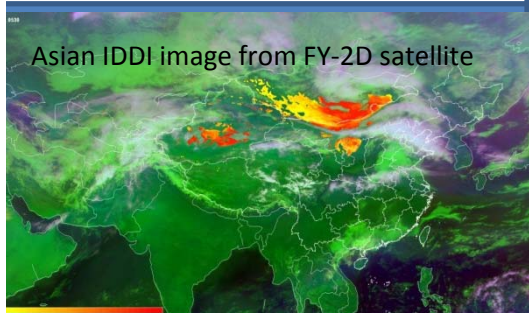


Phoenix Jul 2011 "haboob"

## Using satellite data



## SDS-WAS studies/projects / Model intercomparison and validation

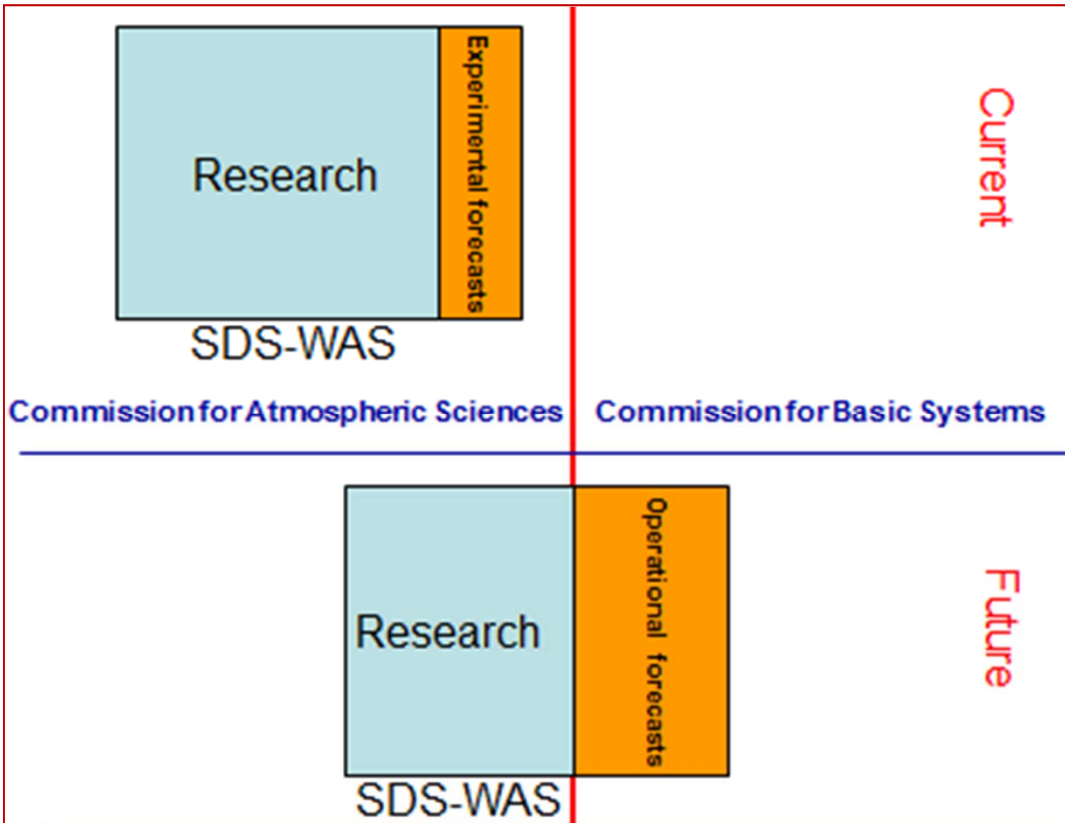






# WMO SDS-WAS: from Research to Operations

- SDS-WAS Science and Implementation Plan for 2015-2020
- Procedure for designation of a Regional Specialized Meteorological Center with specialization on Atmospheric Sand and Dust Forecasting (RSMC-ASDF)
- **Spain (AEMET-BSC) became the first designated RSMC-ASDF**
- China shows interest to host the Asian RSMC-ASDF

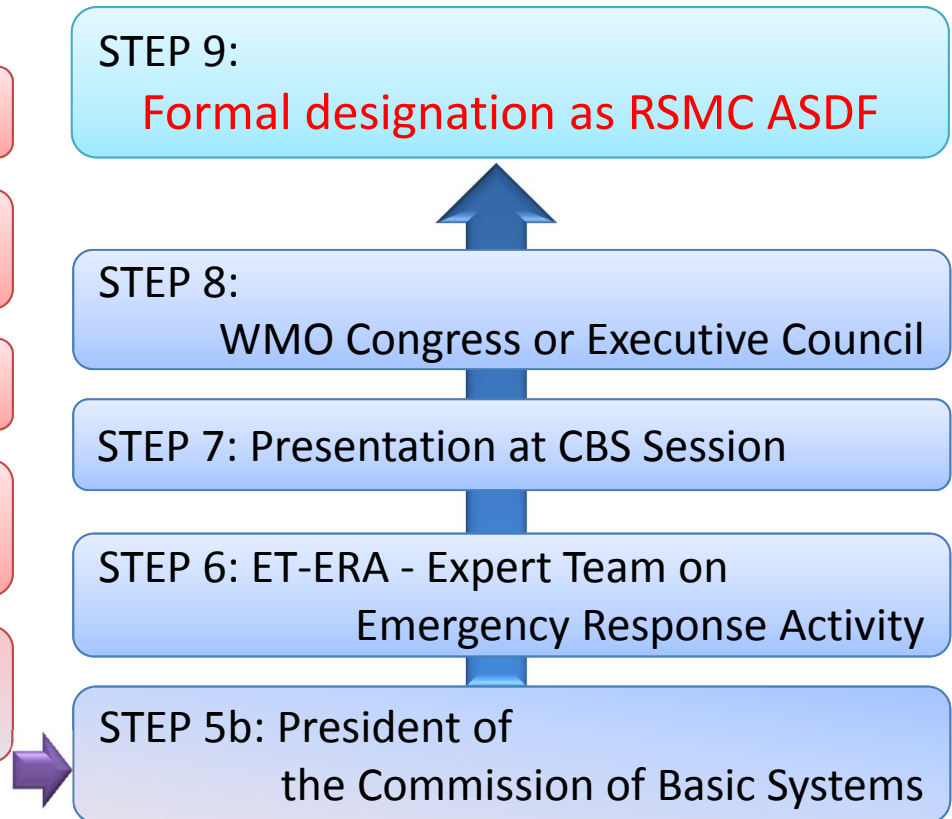




# Designation Process of RSMC ASDF

- Annex 1 of SDS-WAS Science Implementation Plan -

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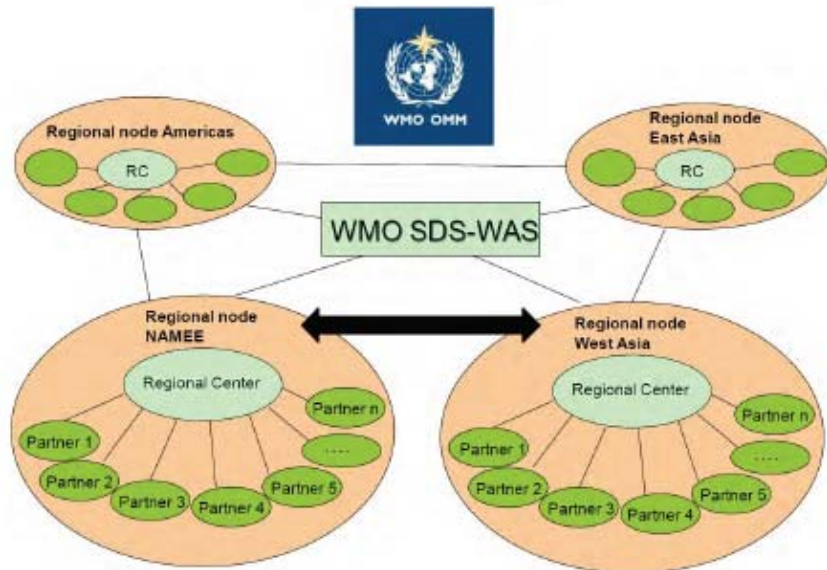
# SDS-WAS Implementation and Research Issues

- Global coordination of the regional SDS-WAS nodes
- Pan-America node development and establishing the West Asian sub-node
- Model validation and intercomparisons
- Dust reanalysis
- High-resolution dust modelling (1-3 km) – towards non-hydrostatic and cloud-resolving scales
- Observation network and NRT data access
- Data assimilation
- Dust interaction with radiation and clouds and impacts to weather and climate => online coupled models
- Chemical and physical characterization of dust and impacts
- Health effects: Dust and meningitis & valley fever
- Closer collaboration with UN programmes for DSS policies and adaptation/preventive measures



# Plans for SDS-WAS West Asia Node:

- Joint WMO-UNEP study in 2013
- Published report =>
- Recent discussions with several countries
- Need further efforts to realise
- To be discussed on this workshop



Establishing a WMO Sand and Dust Storm Warning Advisory and Assessment System Regional Node for West Asia: Current Capabilities and Needs

Technical Report



World Meteorological Organization  
Weather - Climate - Water  
WMO-No. 1121



Available from: [http://www.wmo.int/pages/prog/arep/wwrp/new/documents/1121\\_SDS\\_Technical\\_Report\\_en.pdf](http://www.wmo.int/pages/prog/arep/wwrp/new/documents/1121_SDS_Technical_Report_en.pdf)



*Thank you!*

WMO SDS-WAS web-site:

[http://www.wmo.int/pages/prog/arep/wwrp/new/Sand\\_and\\_Dust\\_Storm.html](http://www.wmo.int/pages/prog/arep/wwrp/new/Sand_and_Dust_Storm.html)



The screenshot shows a web browser displaying the WMO website page for the SDS-WAS program. The page features a blue header with the WMO logo and navigation links. A sidebar on the left contains various menu items. The main content area is titled "World Weather Research Programme (WWRP)" and "WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)". It includes the logos for WWRP and GAW. On the right, there is a "Related items" section listing various documents and calendars.

World Meteorological Organization	Home Secretary-General Weather Climate Water Environment Applications FAQs				
<ul style="list-style-type: none"> <li>About us</li> <li>Governance</li> <li>Members</li> <li>Media centre</li> <li>Programmes</li> <li>GFCS</li> <li>Meetings</li> <li>Publications</li> <li>Library</li> <li>Learning</li> <li>Meteoterm</li> <li>Partnership</li> <li>List of topics</li> <li>Vacancies</li> <li>Visitors' info</li> <li>Youth corner</li> </ul>	World Weather Research Programme (WWRP)				<b>Related items</b>
	WWRP > SDS >				WWRP Scientific Steering Committee (SSC)
	<b>WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)</b>				2014 Calendar
					2013 Calendar
					2012 Calendar
					2011 Calendar
	<b>The SDS-WAS programme at WMO</b>				2010 Calendar
					Publications