Barcelona Supercomputing Center
Centro Nacional de Supercomputación

EXCELENCIA
SEVERO
OCHOA

Alta disponibilidad de los servicios del SDS-WAS y BDFC

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NMMB/BSC-Chemical Transport Model

- The main system is build on the **meteorological driver NMMB**

- *Multiscale*: global to regional scales allowed (nesting capabilities)

- *Nonhydrostatic* dynamical core: single digit kilometre resolution

- *On-line* coupling: weather-chemistry feedback processes allowed

- Enhancement with a *data assimilation* system

http://www.bsc.es/earth-sciences/nmmbbsc-project

Barcelona Dust Forecast Center
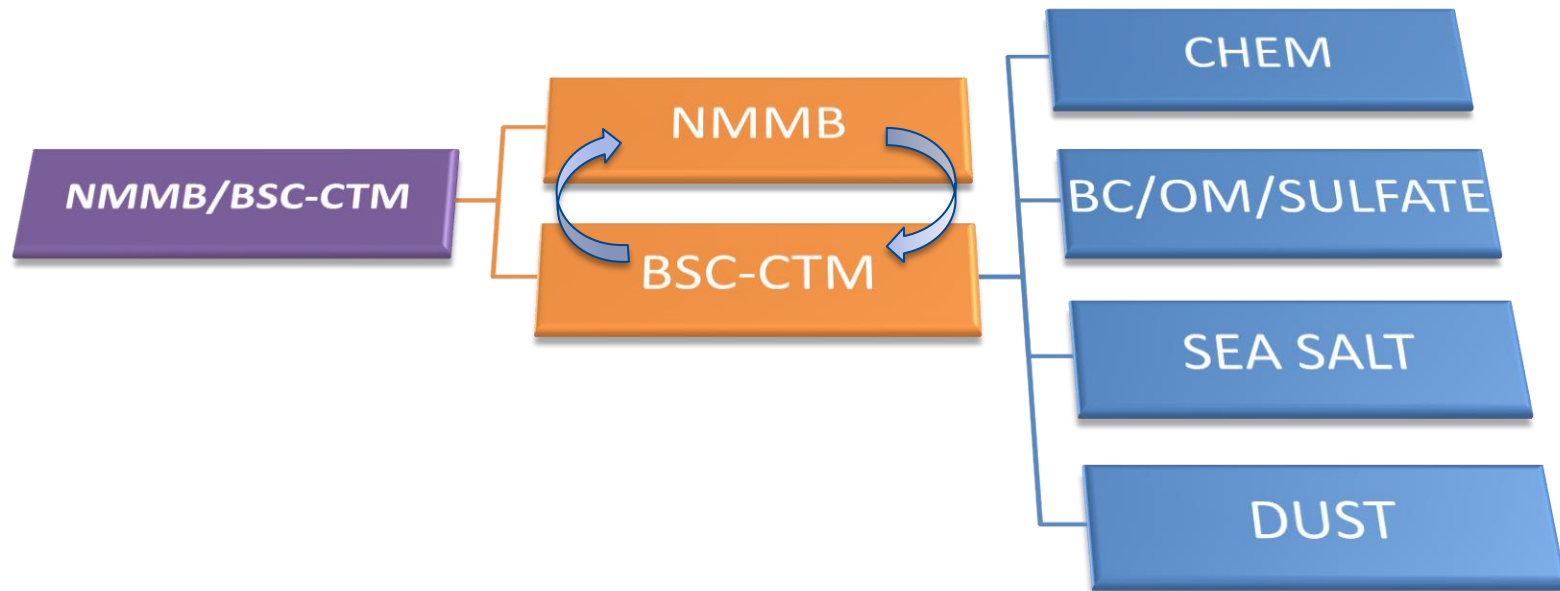
BDFC: First Specialized Centre for Mineral Dust Prediction of WMO NMMB/BSC-Dust *selected to provide operational forecasts at high resolution (~10km) for the NAMEE region*

BDFC: Dust forecast products
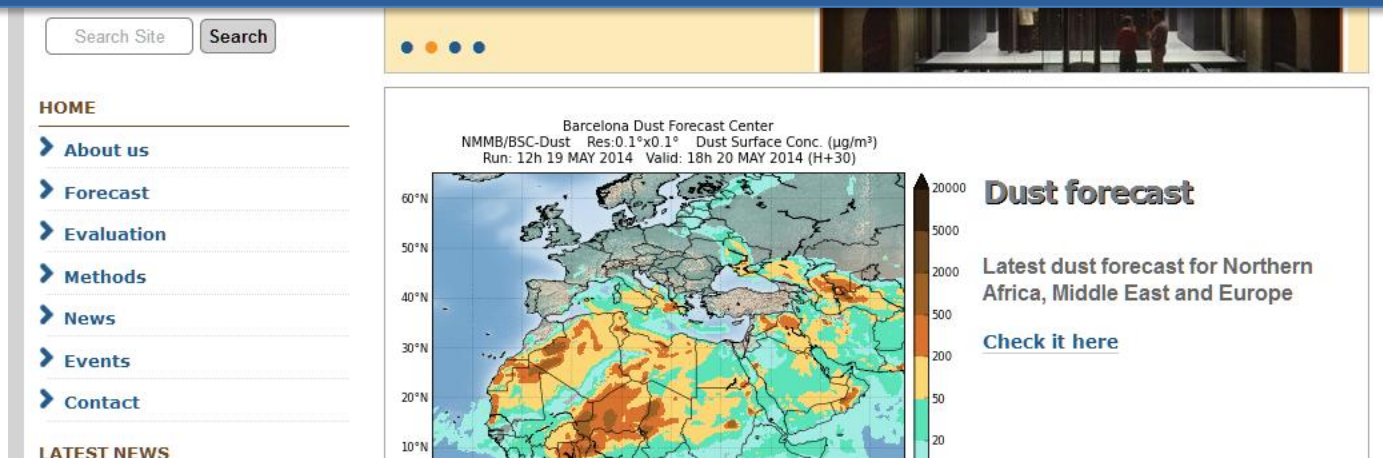
Dust products:
Dust Optical Depth at 550nm
Dust Dry Deposition
Dust Load
Dust Surface Concentration
Dust Surface Extinction at 550nm
Dust Wet Deposition

BDFC: NRT evaluation using AERONET

Santa_Cruz_Tenerife (Spain) - January 2015
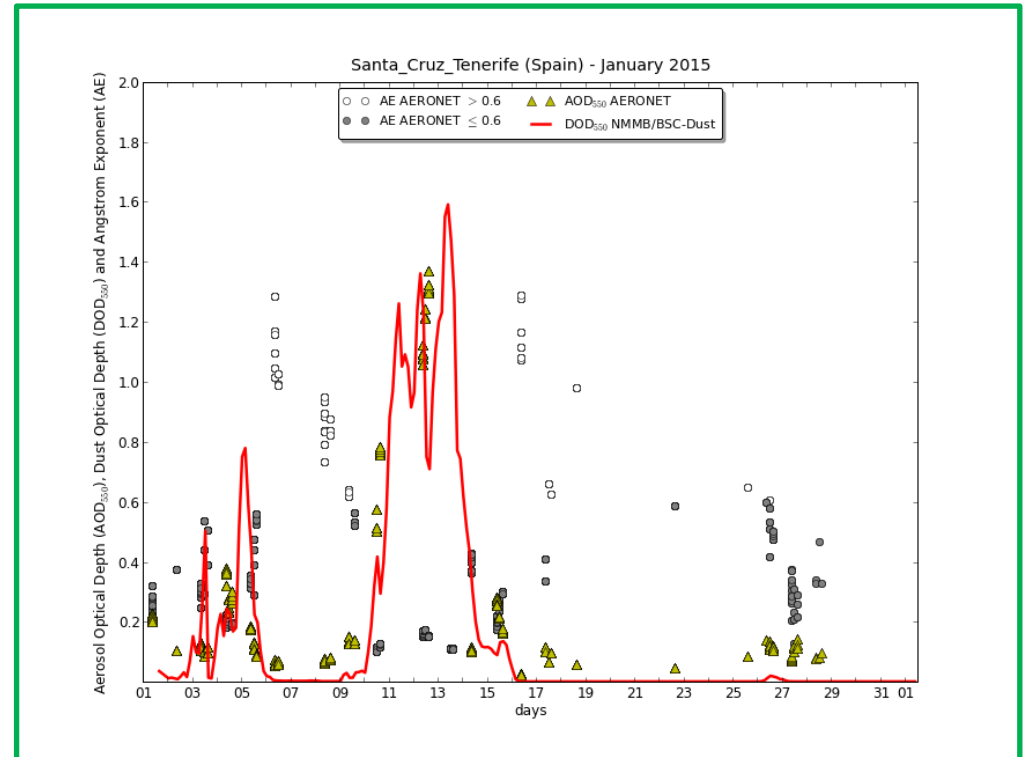
Model evaluation metrics (bias, correlation, RMSE and FGE)

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

Annual scores

Date	2014 ▼

Methods: AERONET-based scores

Jan 2014 - Dec 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	-0.12	0.38	0.51	0.75	7427
Middle East show stations	-0.10	0.27	0.39	0.64	112
Mediterranean show stations	-0.19	0.30	0.46	1.34	4623
TOTAL	-0.15	0.35	0.52	0.98	12162

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BDFC: Operational suite

SDS/BDFC: Web server replication
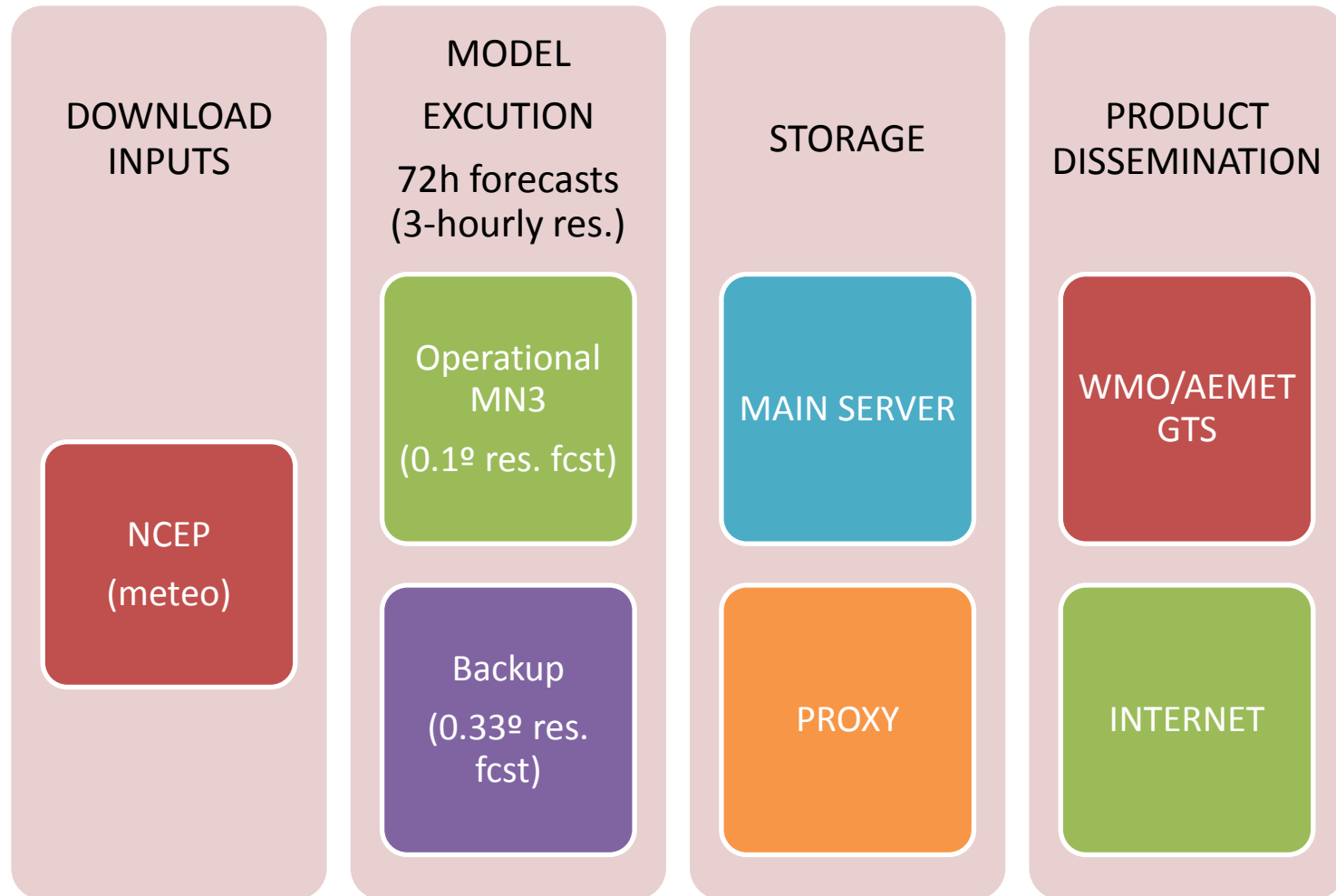
- Goal: create a mirror of the portal http://dust.aemet.es

- Features required

  - Web content management system

  - Data download

  - Product generation (plots, statistics, …)

 - Product dissemination (mail notices/newsletters, AEMET/WMO GTS, EumetCAST, …)

Internet

If BSC connection is not available

BSC

AEMET

Web

Web

Storage

Products

Products

Storage

Nightly synchronization

SDS/BDFC: Web server replication
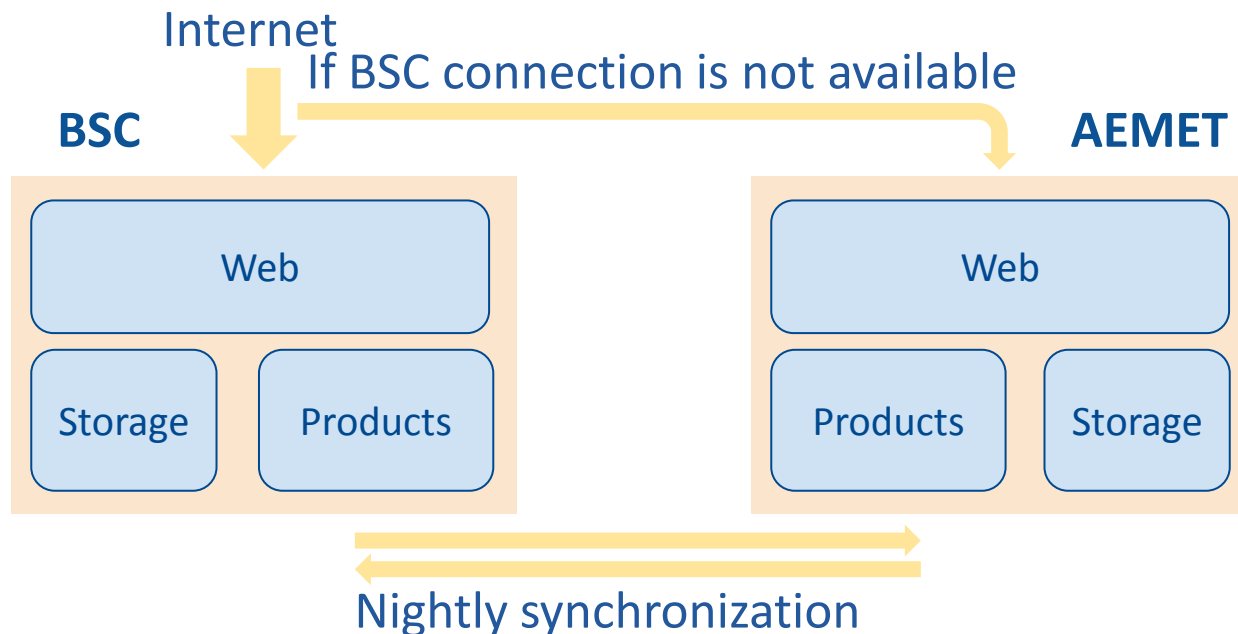
- Status

Web server installation	done
Mail server installation	done
Products software installation	done
Dissemination system	done
Synchronization system	end June
Full test period	mid July
Publication	end July

- Issues to be solved
  - VPN issues at AEMET (still not completely solved)

BDFC: Workflow manager

Autosubmit is the BSC-ES workflow manager and has been adapted to run operational forecasts
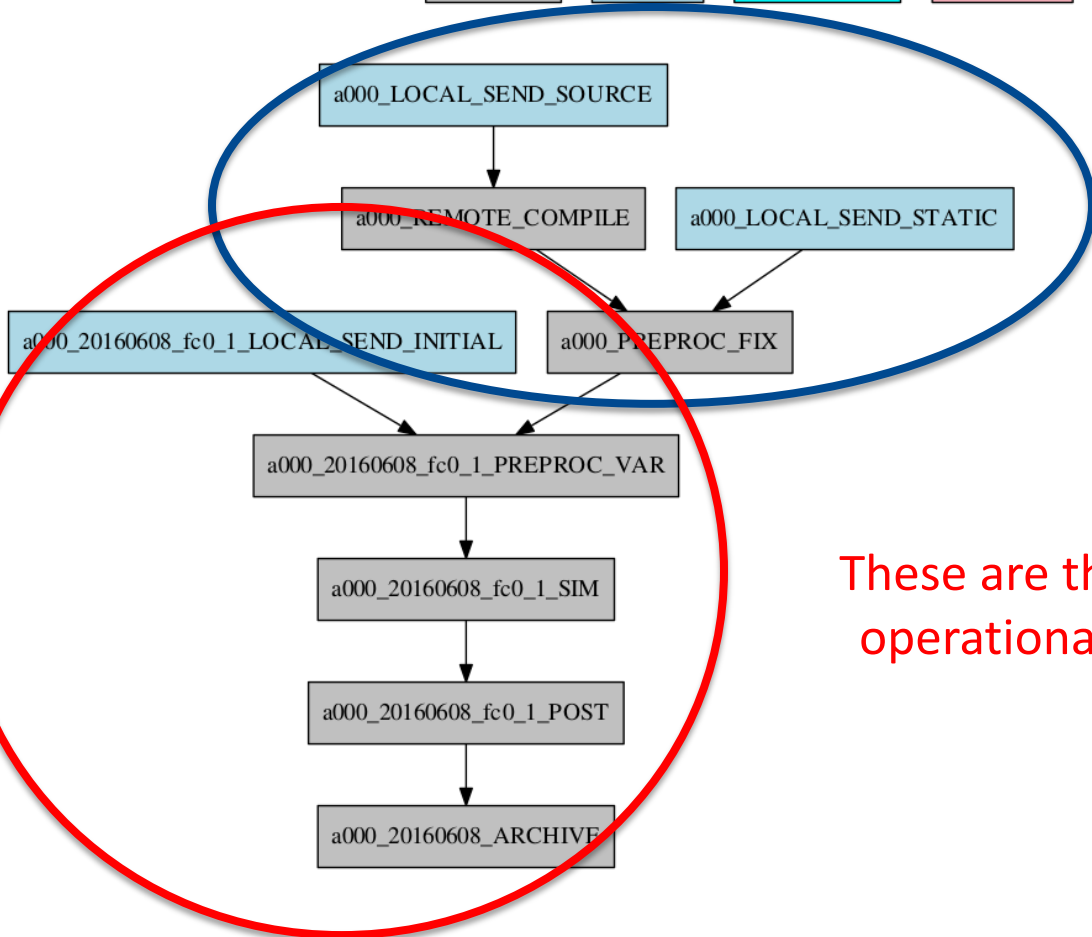
These tasks are only run the first time

These are the daily operational tasks

BDFC: Computational resources

- Marenostrum3 (BSC)
  - 49m in 256 cores
  - 25m sequential
  - 234 cpu/hours per run
  - 909 MB of output (72 hour forecast with 3-hourly frequency)

- CCA (ECMWF)
  - 6875 SBUs per run

SDS-WAS: Cooperation with UNEP

- UNEP distributes products generated by SDS-WAS and BDFC through its platform (UNEPLive). An approach that gives maximum visibility to both centres is being developed.

- UNEP, WMO and UNCCD have been working together in a "Global Assessment of Sand and Dust Storms" that will be released shortly. A draft version is already available. SDS-WAS had an active role in writing the document.
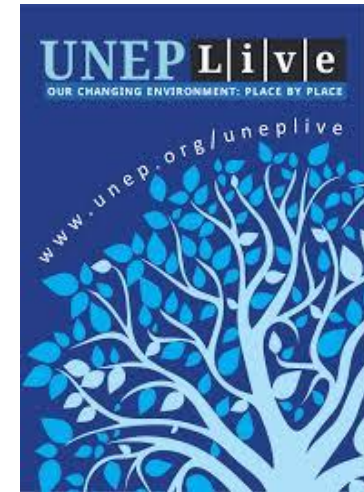
Global Assessment of Sand and Dust Storms

Draft Report

Not for citation