Some useful tools for analysis of SDS

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Climate Change and SDS

IPCC accepts mineral dust as a very important component of atmospheric aerosols, one of the main climate variables.

According to the IPCC's latest climate predictions, it is expected that **sand and dust storms will be more intense** as the frequency and severity of the drought has increased.

Some useful tools for analysis of SDS

EOSDIS Worldview – NASA

https://worldview.earthdata.nasa.gov/

NASA Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/

HYSPLIT-WEB (Internet-based)

http://ready.arl.noaa.gov/HYSPLIT.php/

ESRL : PSD : Monthly/Seasonal Composites - NOAA Earth System

https://www.esrl.noaa.gov/psd/cgi-bin/data/composites/printpage.pl

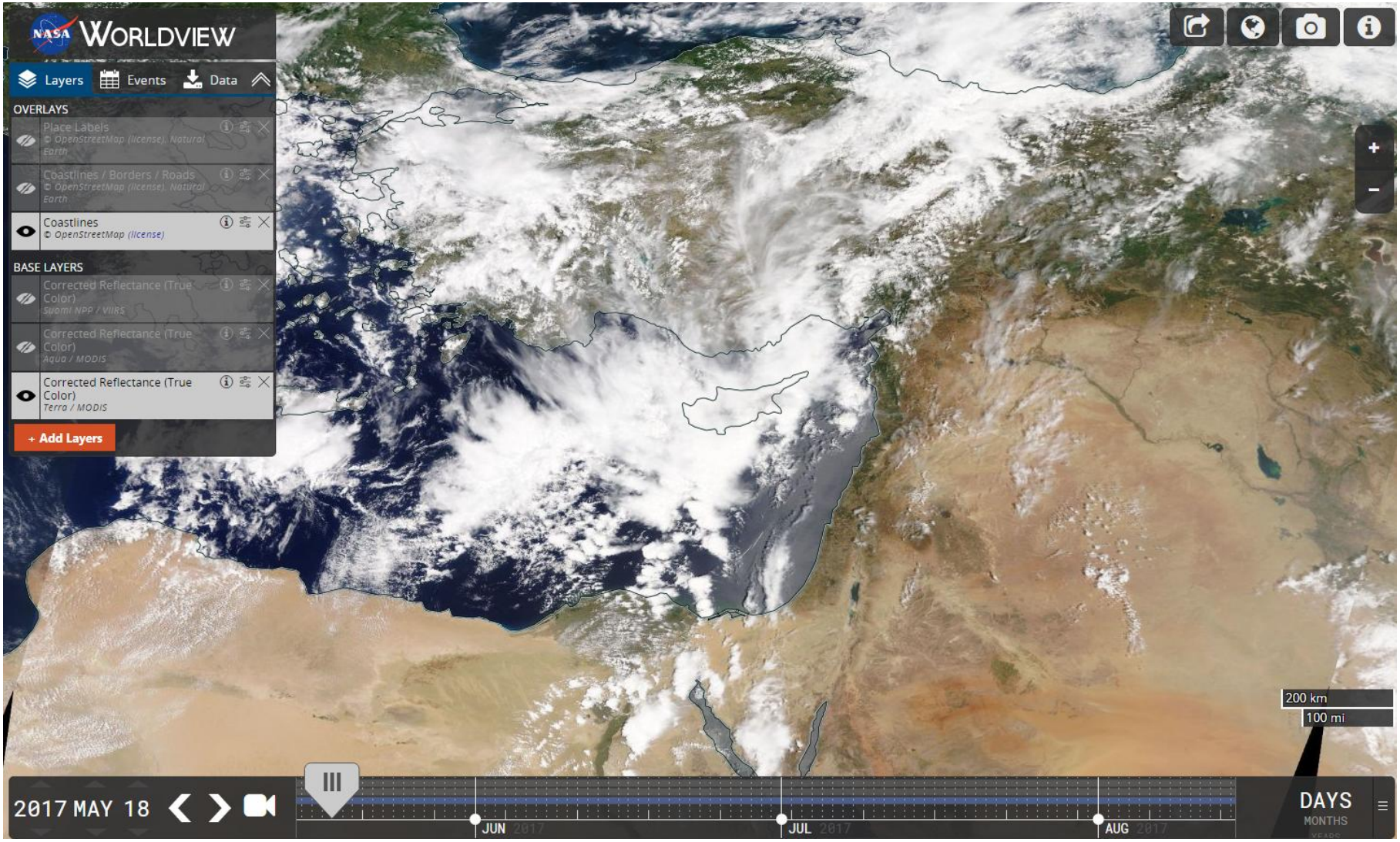
Case Study – Nusaybin, 19.05.2017

The dust storm in Nusaybin affected life negatively, 19.05.2017

The dust cloud coming from Syria and affecting the Nusaybin district of Mardin affected the life negatively because the falling rain turned into mud.

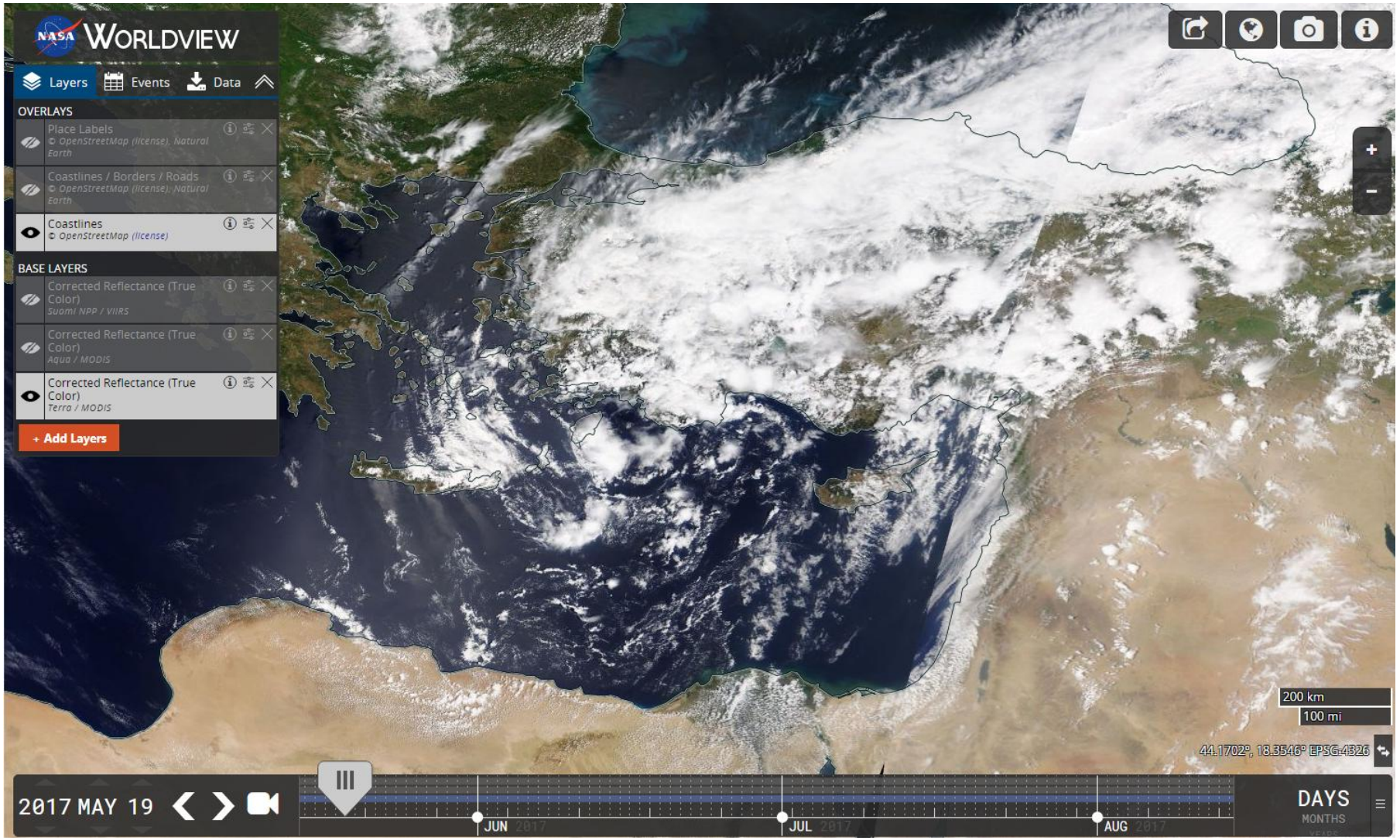
EOSDIS Worldview – NASA, 18.05.2017

https://worldview.earthdata.nasa.gov



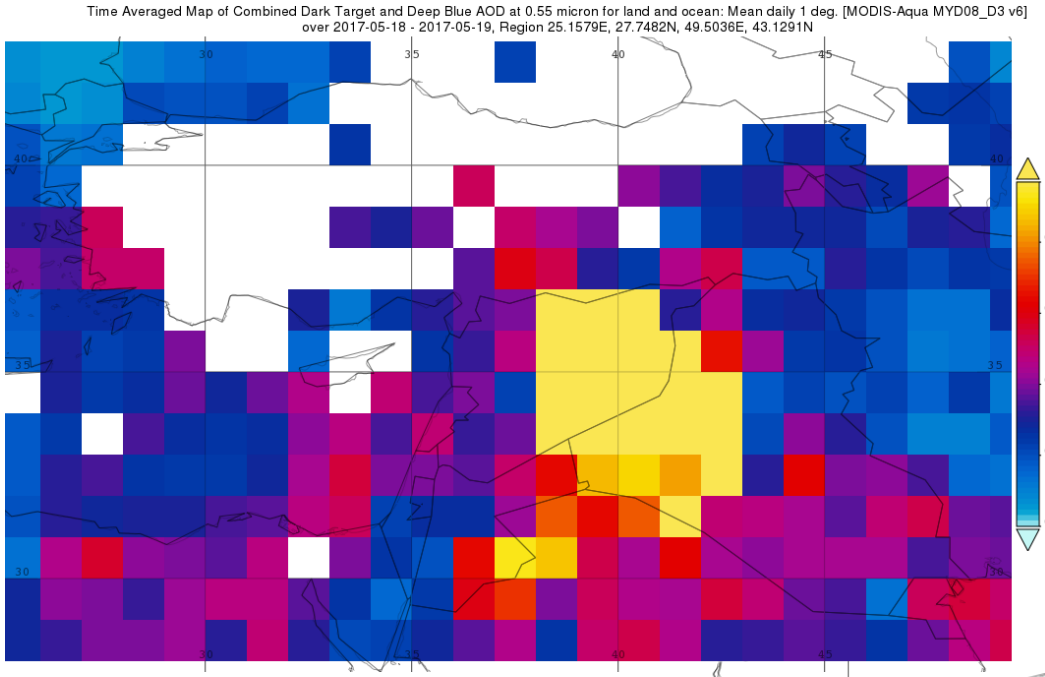
EOSDIS Worldview – NASA, 19.05.2017

https://worldview.earthdata.nasa.gov



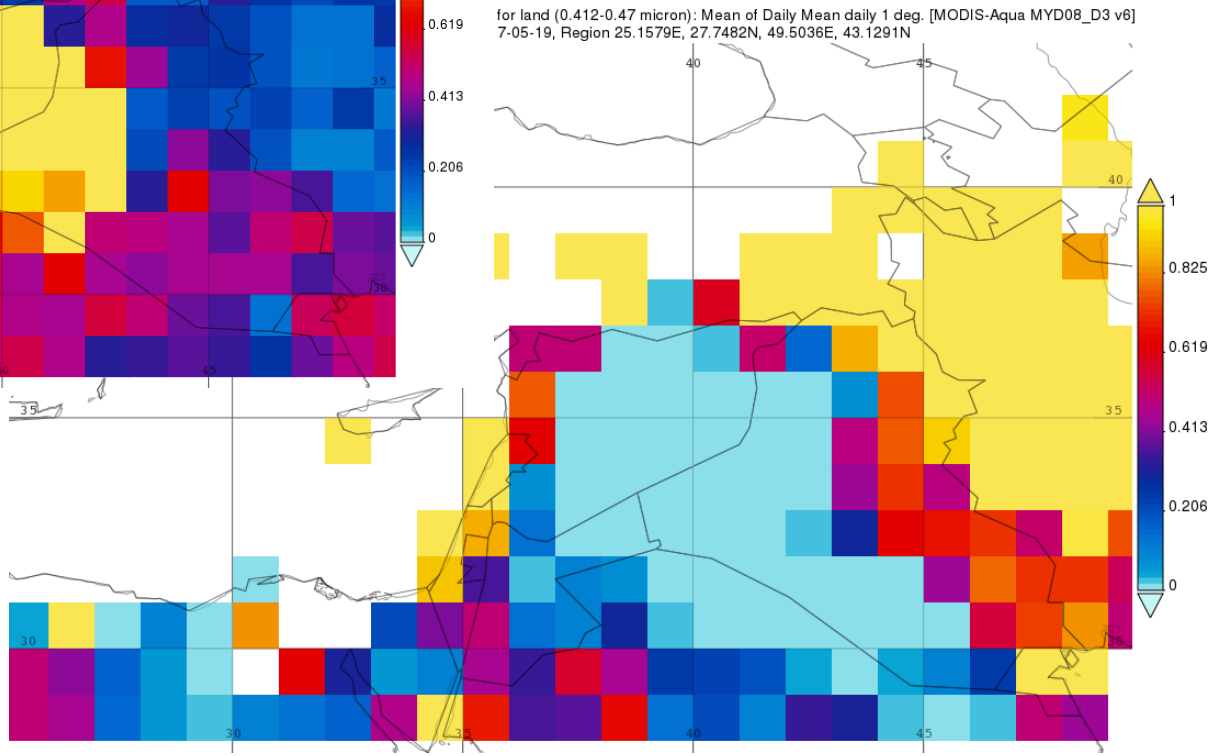
NASA Giovanni

https://giovanni.gsfc.nasa.gov/giovanni



AOD -Aqua

AE -Aqua



NASA Giovanni

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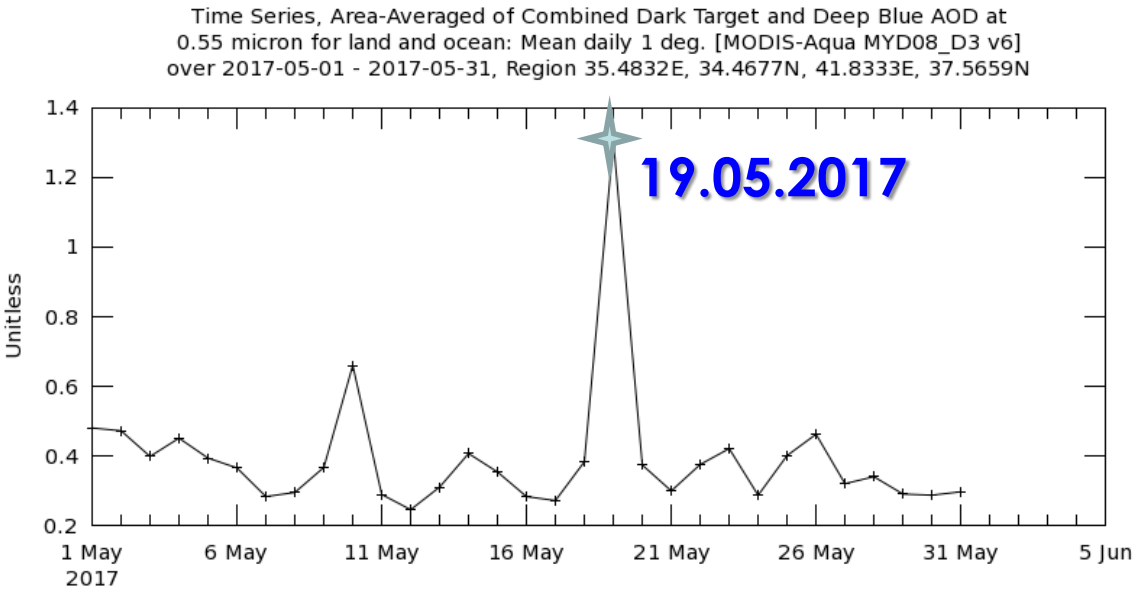
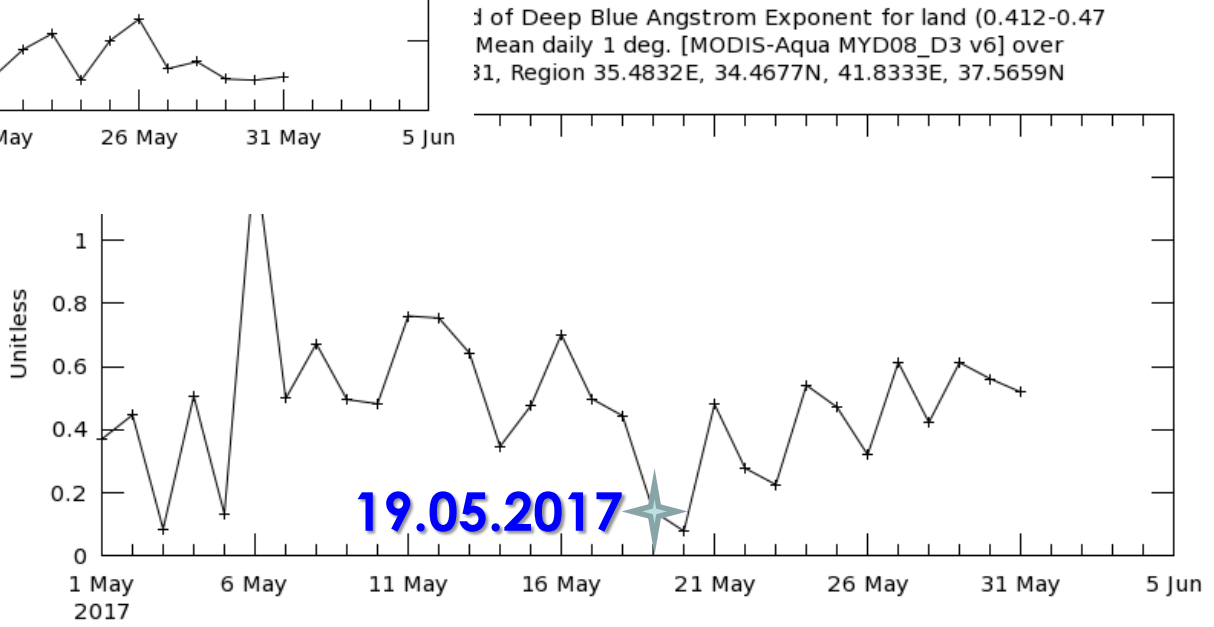
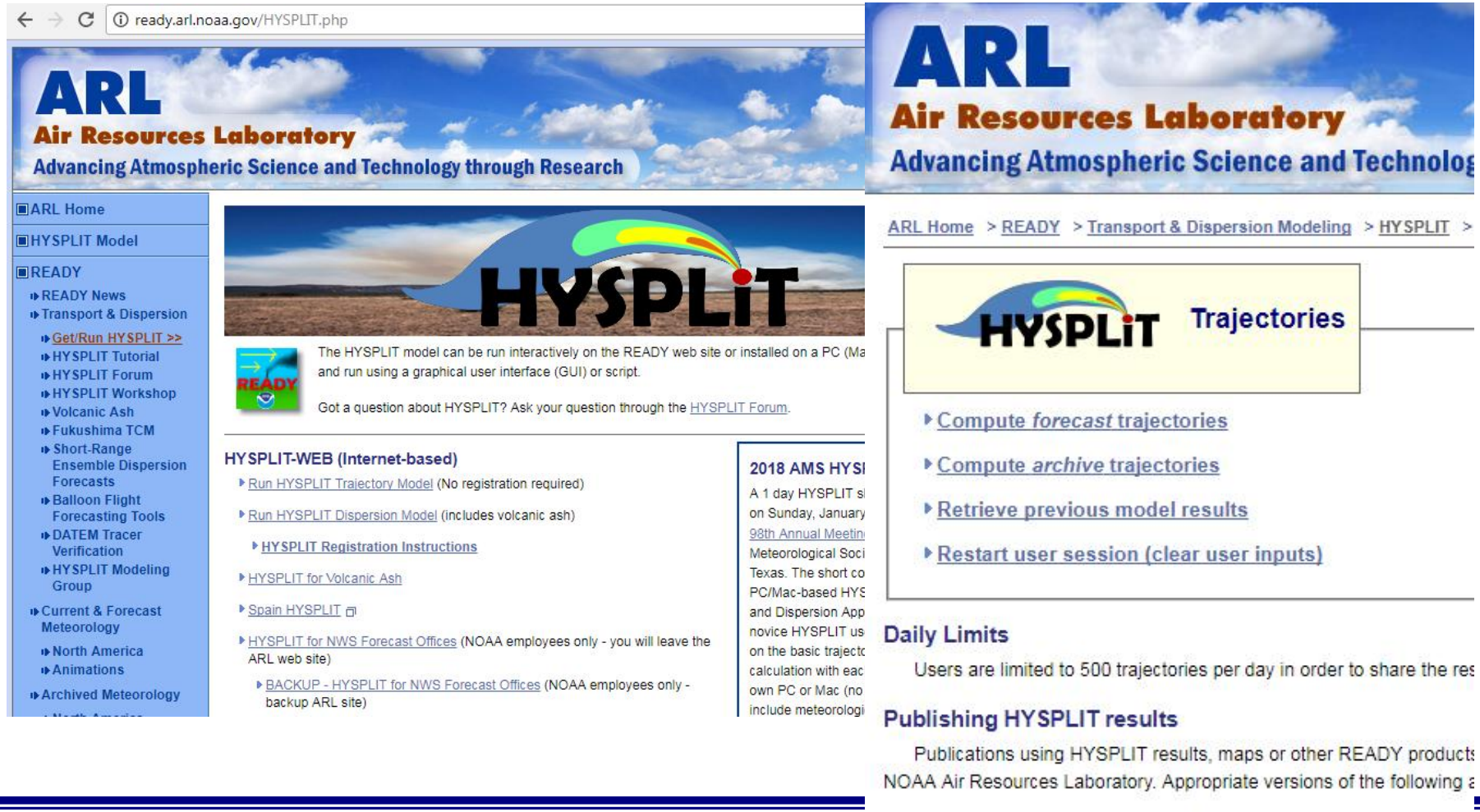




HYSPLIT-WEB (Internet-based)

http://ready.arl.noaa.gov/HYSPLIT.php

You can use HYSPLIT model for the detection of SDS source area.



HYSPLIT-WEB (Internet-based)

http://ready.arl.noaa.gov/HYSPLIT.php

ARL Home > READY > Transport & Dispersion Modeling

HYSPLIT Trajectories

- Compute *forecast* trajectories
- Compute *archive* trajectories
- Retrieve previous model results
- Restart user session (clear user inputs)

ARL Home > READY > Transport & Dispersion Modeling > HYSPLIT > HYSPLIT Trajectory Model

READY users produced 3197 un-registered HYSPLIT simulations since 00 UTC today!

Type of Trajectory(ies)

Number of Trajectory Starting Locations (1 / 2 / 3) Note: By choosing just one source location, more options for selecting the location will be presented on the next page, such as choosing by latitude/longitude, by WMO ID, or by plant location. Multiple source locations limit the input to just latitude/longitude positions. This option is ignored for trajectory ensemble and frequency.

Type of Trajectory (Normal / Matrix / Ensemble / Frequency)

Next>>

HYSPLIT-WEB (Internet-based)

http://ready.arl.noaa.gov/HYSPLIT.php

ARL Home > READY > Transport & Dispersion Modeling > HYSPLIT > HYSPLIT Trajectory Model

Meteorology & Starting Location(s)

Trajectory Calculation

Meteorology: GDAS (1 degree, global, 2006-present) More info

Source Location (enter using **one** of the following methods):

- Open Map Display
- Decimal Degrees Latitude: 37.07 N Longitude: 41.22 E
- DDD/MM/SS Latitude: Deg. Min. Sec. N Longitude: Deg. Min. Sec. W
- City (Country or State: name: lat: lon):
- Airport or WMO ID (i.e., dca): ID Lookup

Reset Form Next>>

HYSPLIT-WEB (Internet-based)

http://ready.arl.noaa.gov/HYSPLIT.php

ARL Home > READY > Transport & Dispersion Modeling > HYSPLIT > HYSPLIT Trajectory Model

Meteorology File

Meteorology: Archived GDAS1
Source Location: Lat: 37.070000 Lon: 41.220000

Choose an archived meteorological file
Archive File: gdas1.may17.w3

Next>>

HYSPLIT-WEB (Internet-based)

http://ready.arl.noaa.gov/HYSPLIT.php

Model Run Details

Request trajectory

The archived data file (GDAS1) has data beginning at 05/15/17 0000 UTC.

Model Parameters

Trajectory direction: ○ Forward ◉ Backward (Change the default start time!) More info

Vertical Motion: ◉ Model vertical velocity ○ Isobaric ○ Isentropic More info

Start time (UTC): year 17 | month 05 | day 19 | hour 12 More info
Current time: 11:50

Total run time (hours): 96 More info

Start a new trajectory every: 0 hrs Maximum number of trajectories: 24 More info

Start 1 latitude (degrees): 37.070000 More info

Start 1 longitude (degrees): 41.220000 More info

Start 2 latitude (degrees):

Start 2 longitude (degrees):

Start 3 latitude (degrees):

Start 3 longitude (degrees):

Level 1 height: 10 ◉ meters AGL ○ meters AMSL More info

Level 2 height: 1500

Level 3 height: 3000

HYSPLIT-WEB (Internet-based)

ARL Home > READY > Transport & Dispersion Modeling > HYSPLIT > HYSPLIT Trajectory Model

HYSPLIT Trajectory Model Results

HYSPLIT MODEL RESULTS FOR JOB NUMBER 161609

Model Status:

```
Complete Hysplit
Percent complete: 100.0
Percent complete:  99.0
```

There are no graphics files available yet. This page will reload every 10 seconds until the model and graphics have finished.

- HYSPLIT SETUP file.

Return to main menu (keep user inputs)

Return to main menu (clear user inputs)

http://ready.arl.noaa.gov/HYSPLIT.php

HYSPLIT-WEB (Internet-based)

HYSPLIT Trajectory Model Results

HYSPLIT MODEL RESULTS FOR JOB NUMBER 159792

Model Status:

```
Thu Oct 26 07:53:50 EDT 2017
The model and graphics are now complete.
Finished generating graphics for job 159792.
```

RESULTS	Click on text link to view images in a new window.	
	GIF Plots	PDF Plots
Trajectories	.gif	.pdf

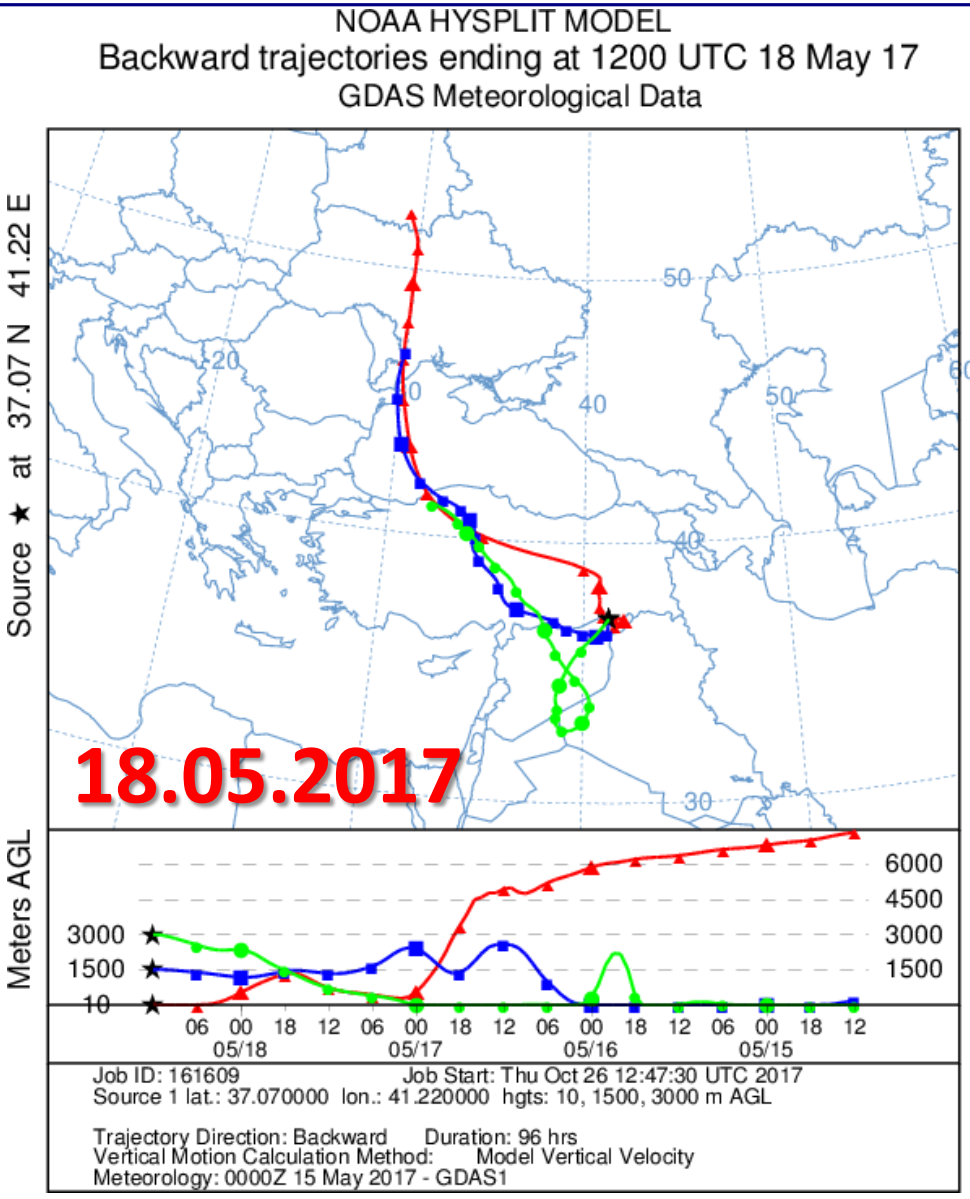
- Modify the trajectory plot without rerunning the model.
- Trajectory endpoints file.
  - Trajectory endpoints format help.
- HYSPLIT SETUP file.
- HYSPLIT CONTROL file.
- HYSPLIT MESSAGE (diagnostics) file.
  - MESSAGE file format help (pdf)

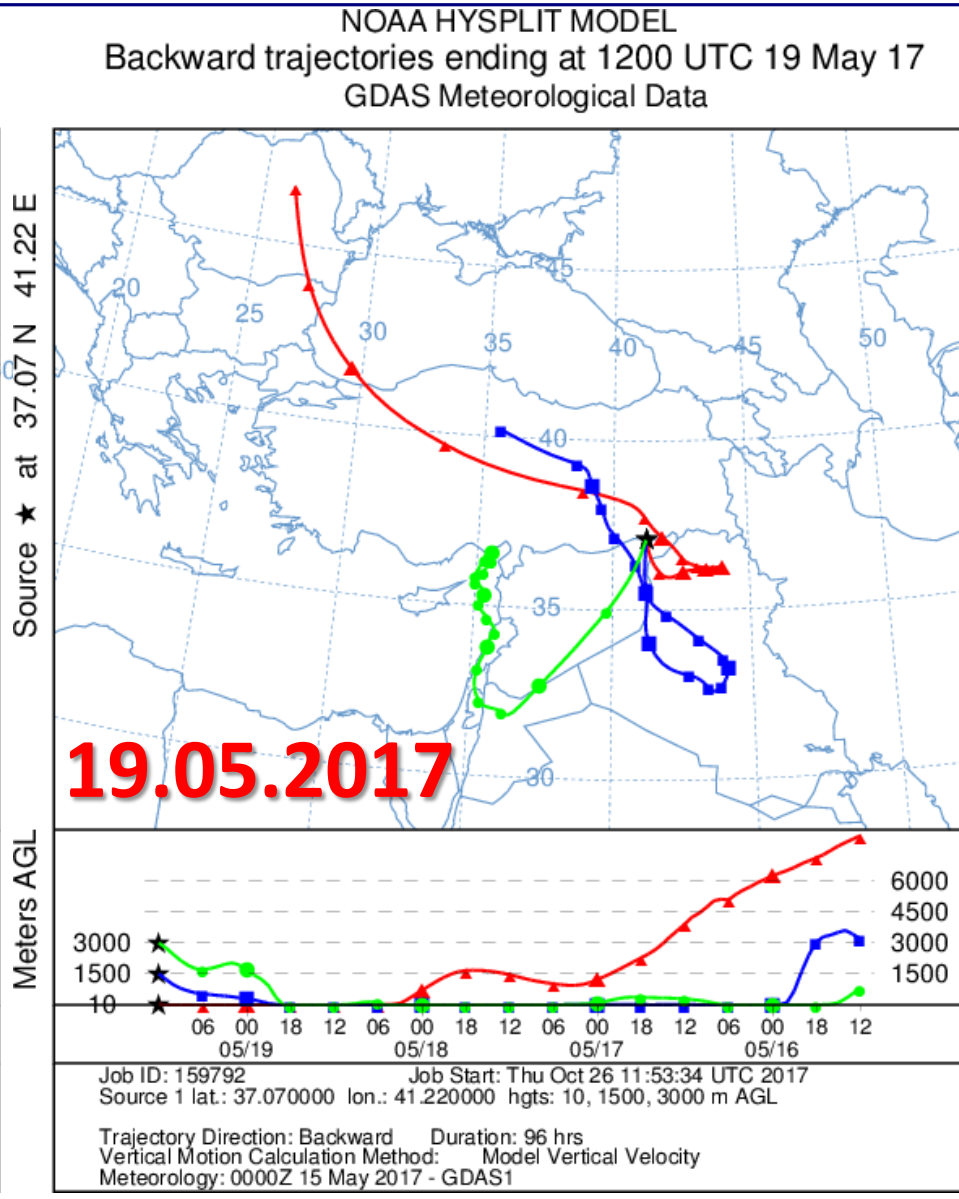
Return to main menu (keep user inputs)

Return to main menu (clear user inputs)

http://ready.arl.noaa.gov/HYSPLIT.php

HYSPLIT-WEB (Internet-based)





NOAA - ESRL : Monthly/Seasonal Composites

https://www.esrl.noaa.gov/psd/cgi-bin/data/composites/printpage.pl

U.S. Department of Commerce | National Oceanic & Atmospheric Administration | NOAA Research

Earth System Research Laboratory
Physical Sciences Division

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Help

In order to help ensure that this web analysis page remains available, we would greatly appreciate feedback on its use, particularly in the classroom, for presentations or for research. Mail to ESRL/PSD data at (esrl.psd.data@noaa.gov).

Help

- Instructions
- Datasets and variables
- Index time-series Info
- Use your own time-series

Background Information

- Referencing Plots

Related Plot/Analysis

- Plot daily composites
- Plot 6-hourly composites

We have transitioned the data files from netCDF3 to netCDF4-classic format on Monday Oct 20th, 2014.

Monthly/Seasonal Climate Composites

Plot seasonal composites (averages) of the mean or anomalies (mean - total mean) of variables from the NCEP reanalysis and other datasets. NCEP data is available from **Jan 1948** to **Sep 2017** . Other datasets have different time ranges. Note the climatology used for the anomaly and long term mean plots is now **1981-2010** to match the new climate normal timeperiod.

Which variable? Geopotential Height **Level?** 1000mb
Beginning month of season: Jan **Ending month:** Jan
Enter years for composites (from 1 to 20): e.g. 1972. For seasons that span a year (e.g. DJF), please enter year of the **LAST** month.

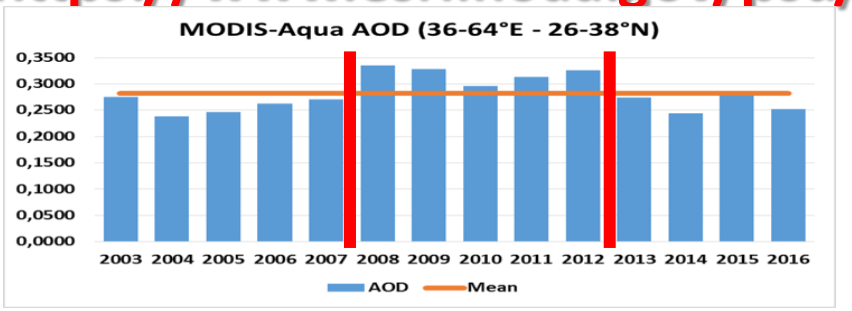
To subtract one set of years from another, use a minus sign (-) before the years that are to be subtracted.

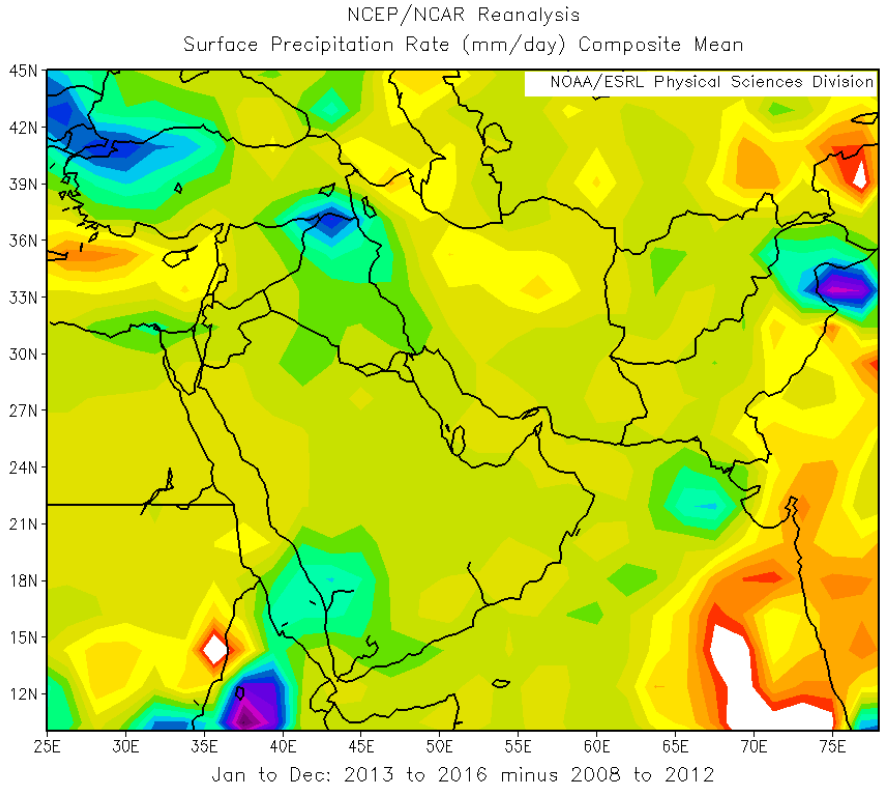
OR Enter range of years: to (optional minus to)
OR List of years: Enter filename:
OR Years from values in Time Series: None

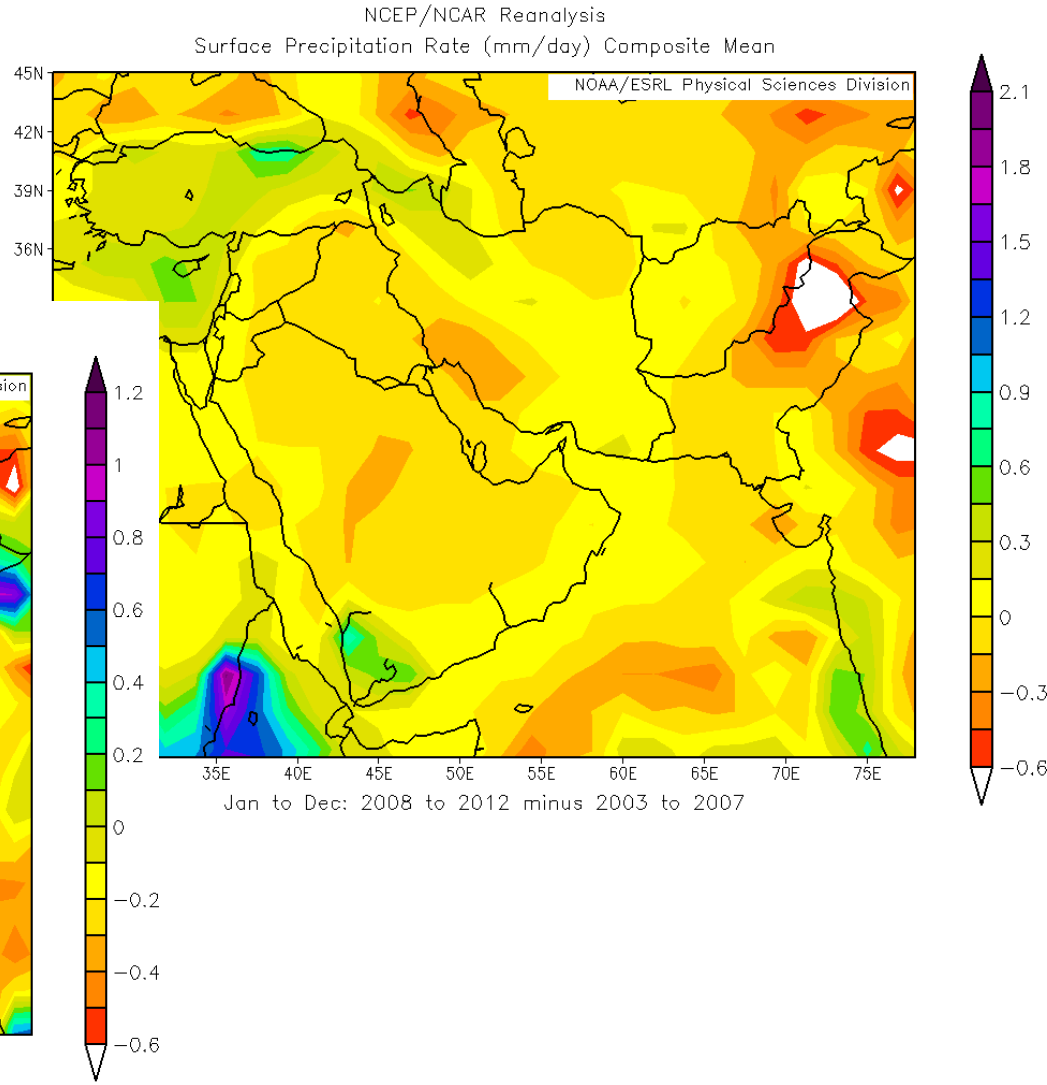
If CUSTOM Time Series:

NOAA - ESRL : Monthly/Seasonal Composites

https://www.esrl.noaa.gov/psd/cgi-bin/data/composites/printpage.pl







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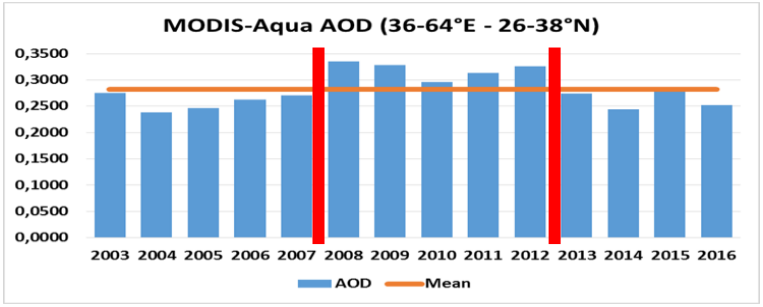

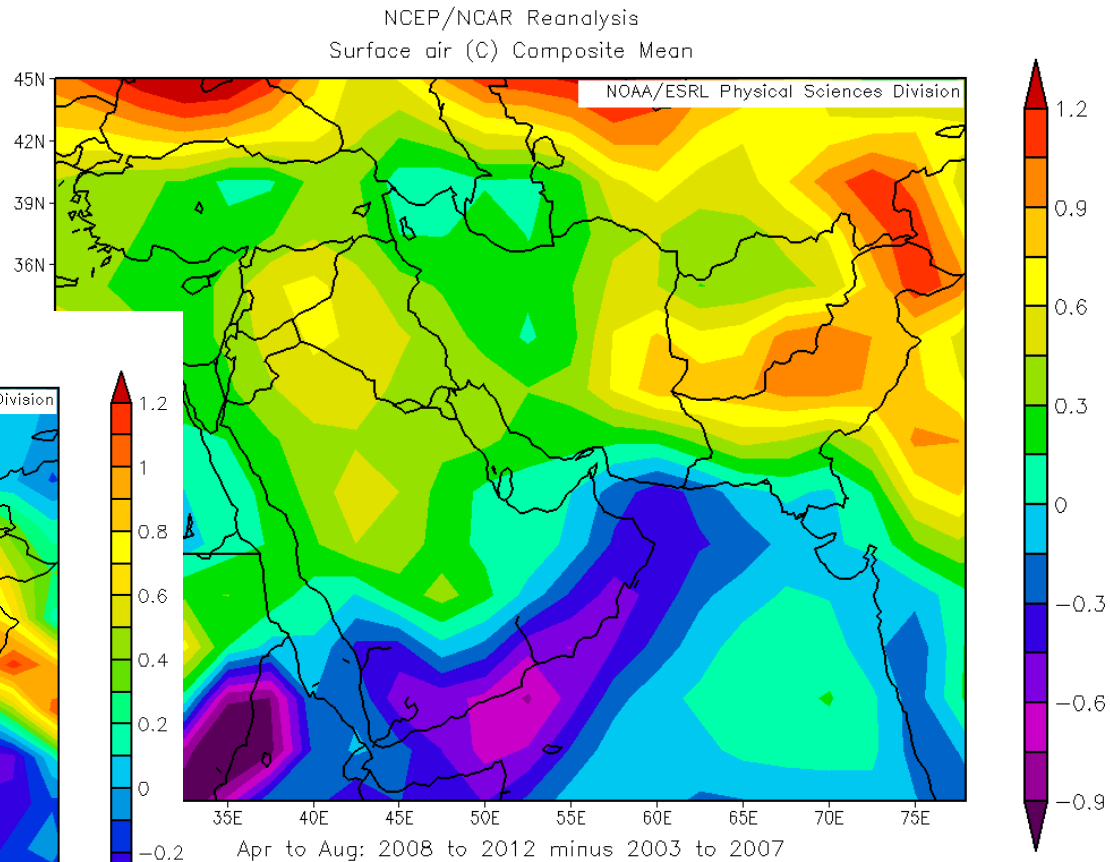

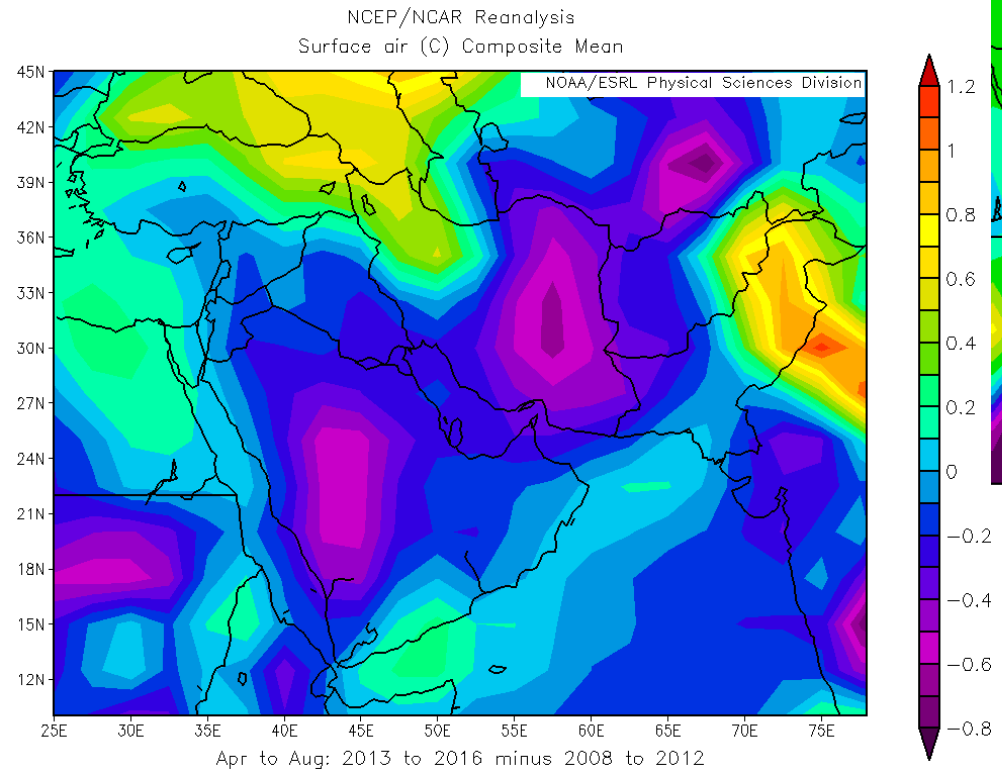

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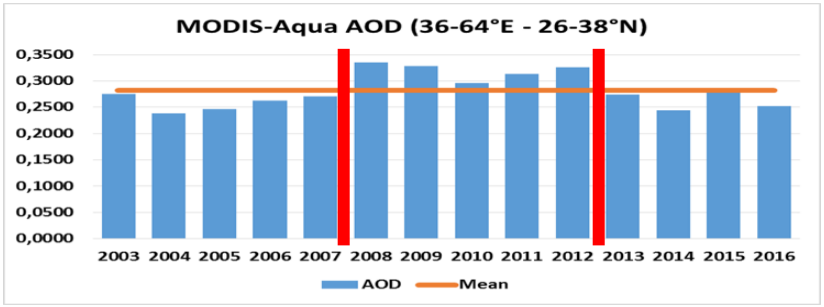

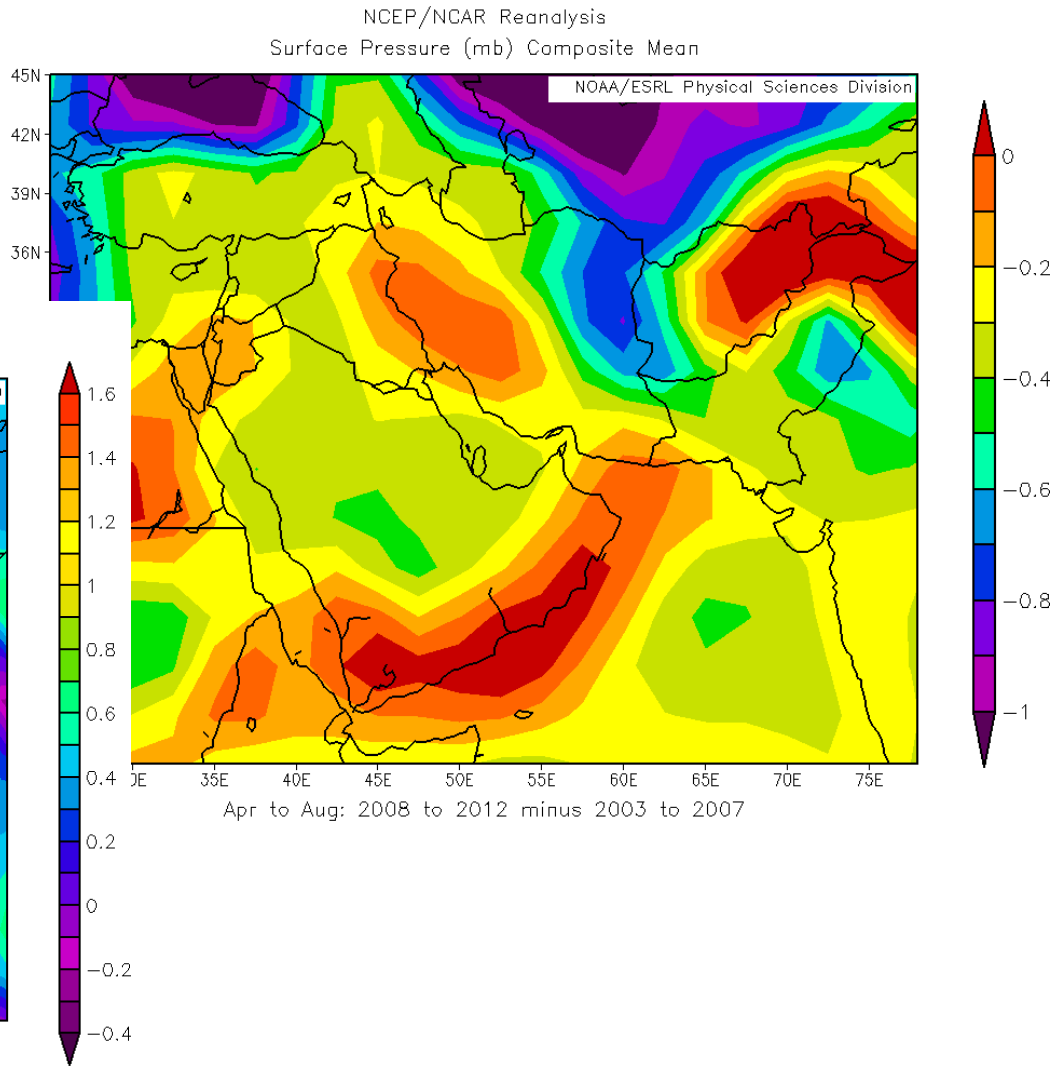

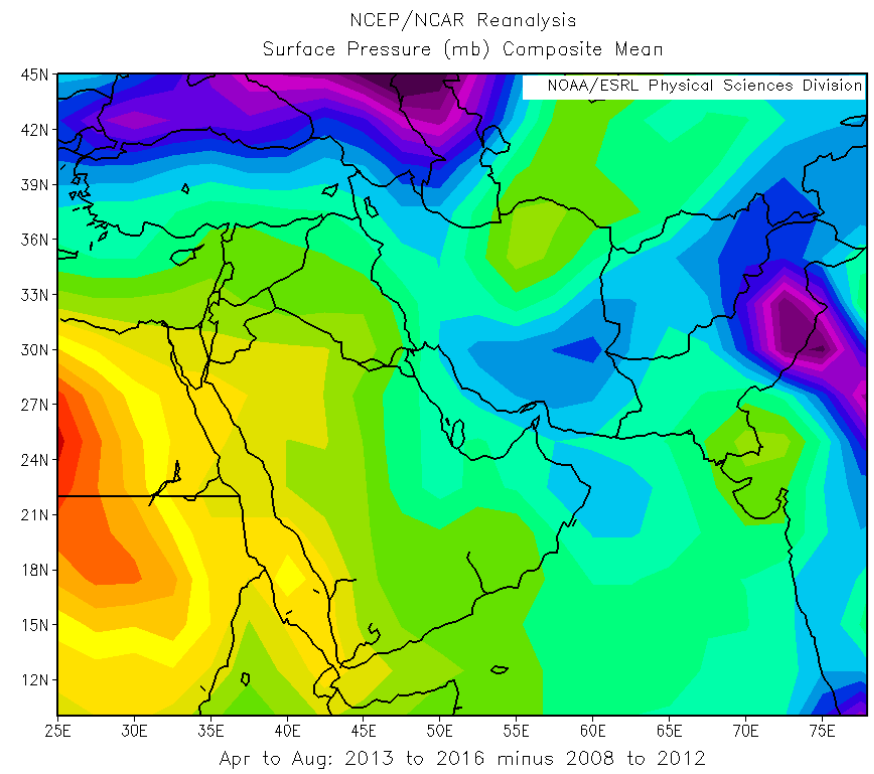

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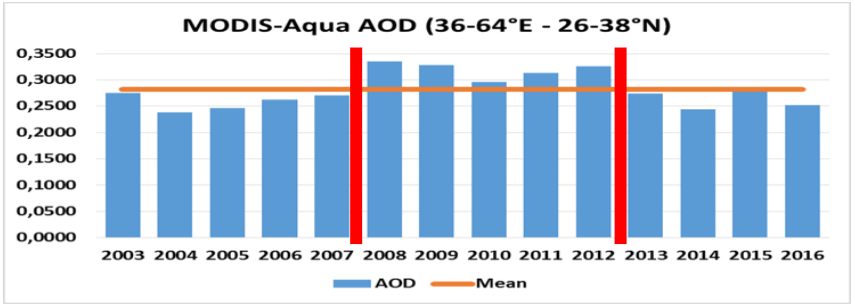
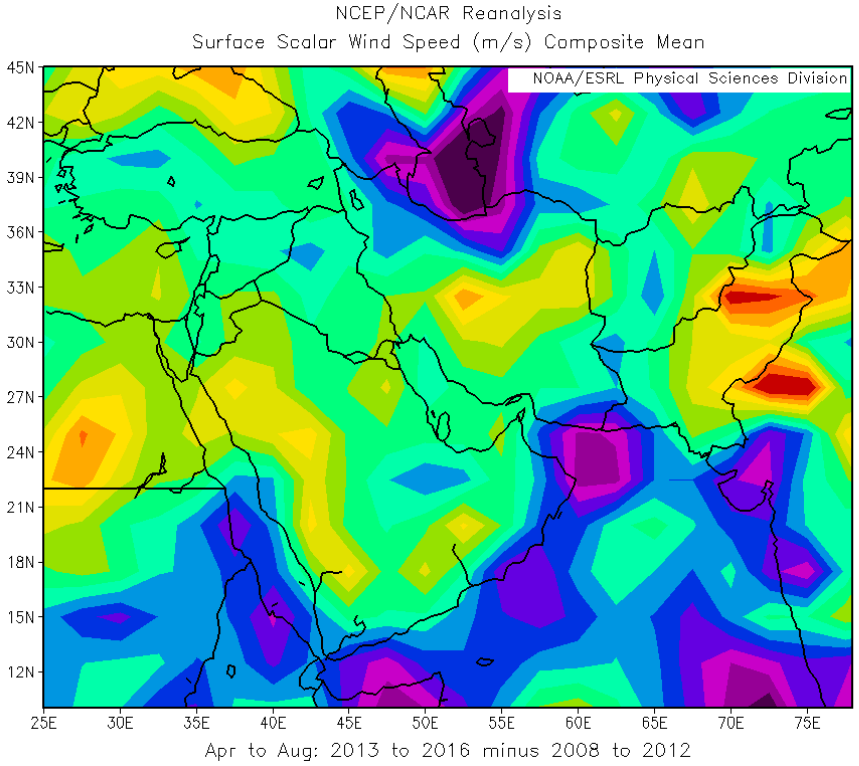
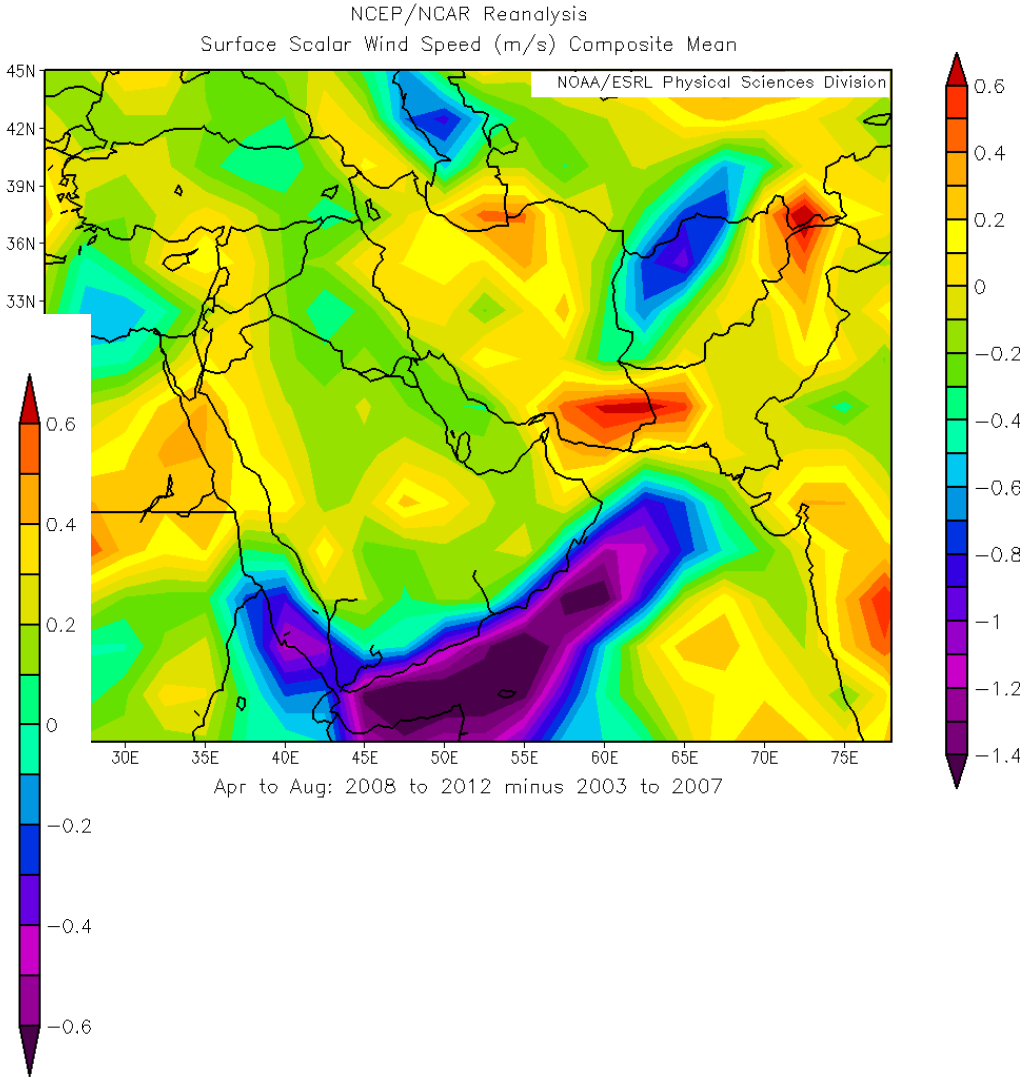
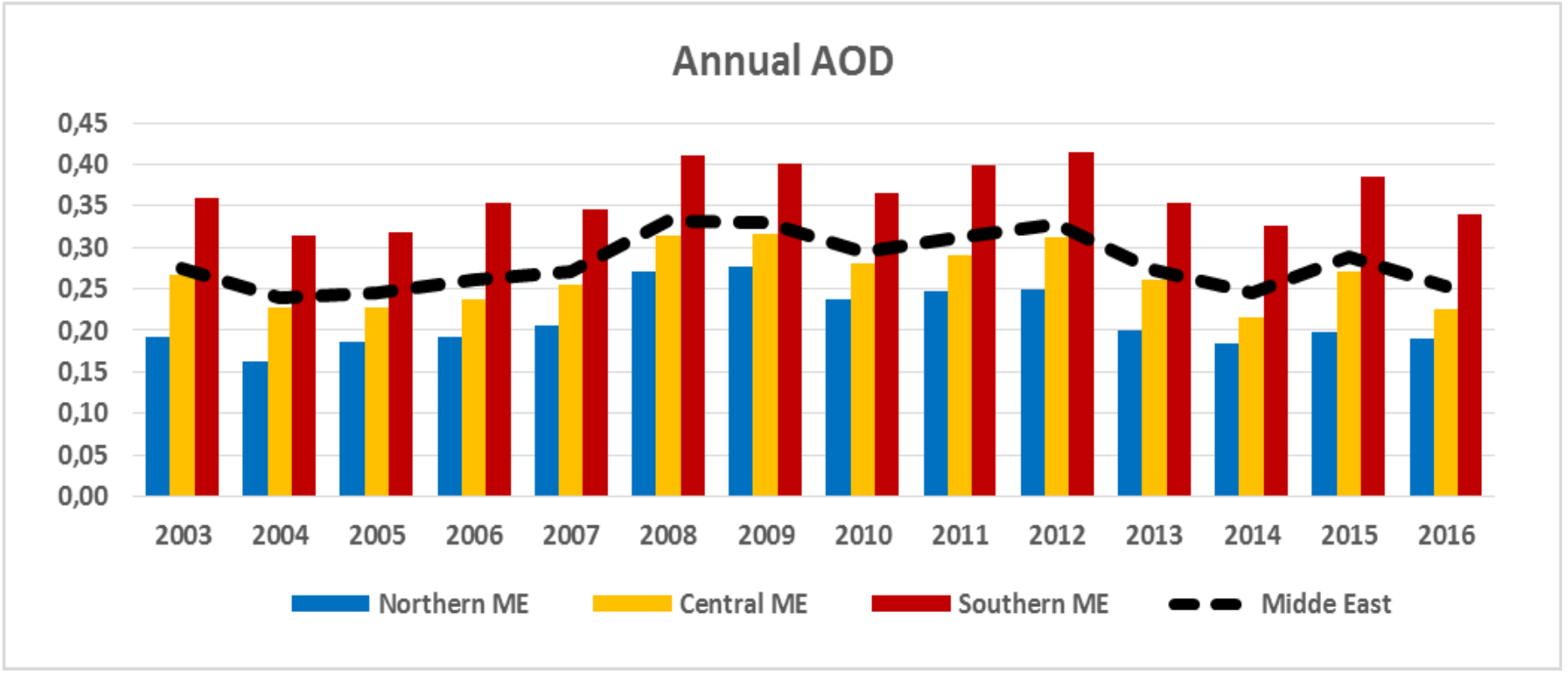






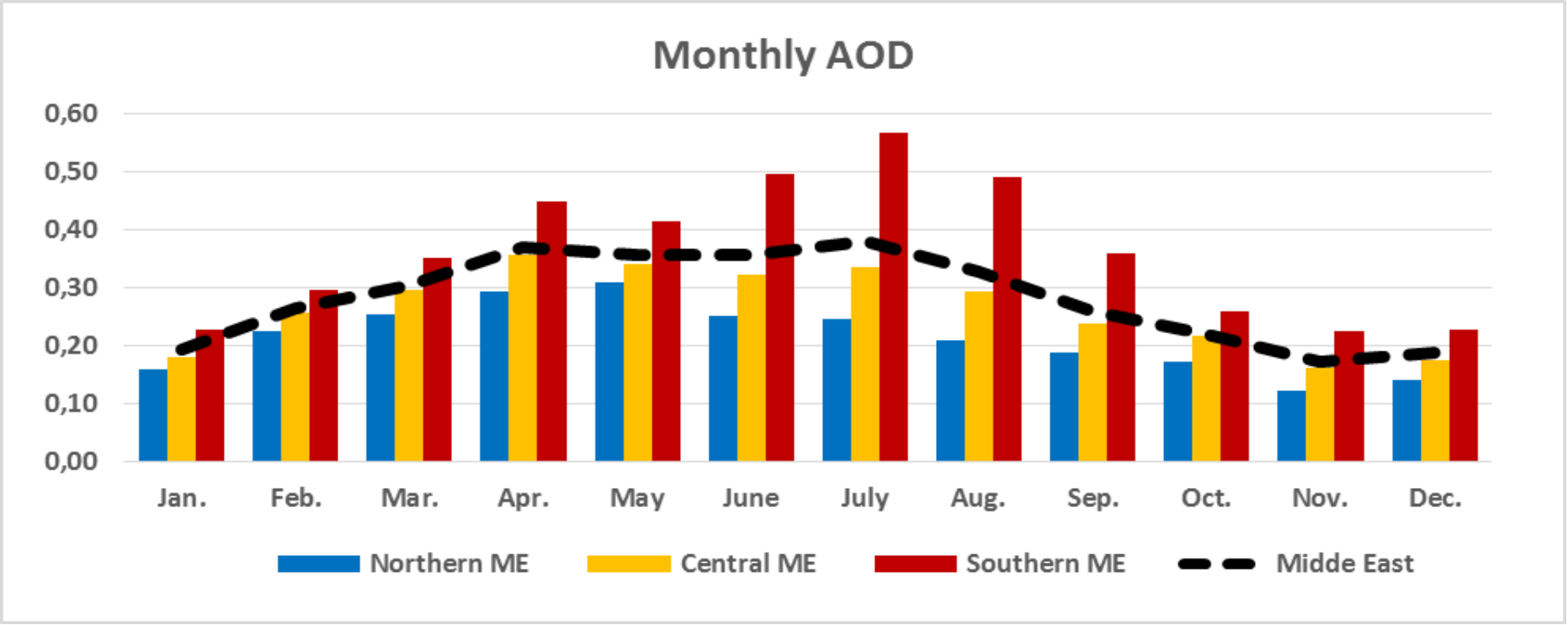
NASA Giovanni - Annual AOD Trends

Annual AOD values of the Central Middle East almost follow the averaged values of the Middle East Region as expected, while higher values of AOD are observed in the Southern ME.

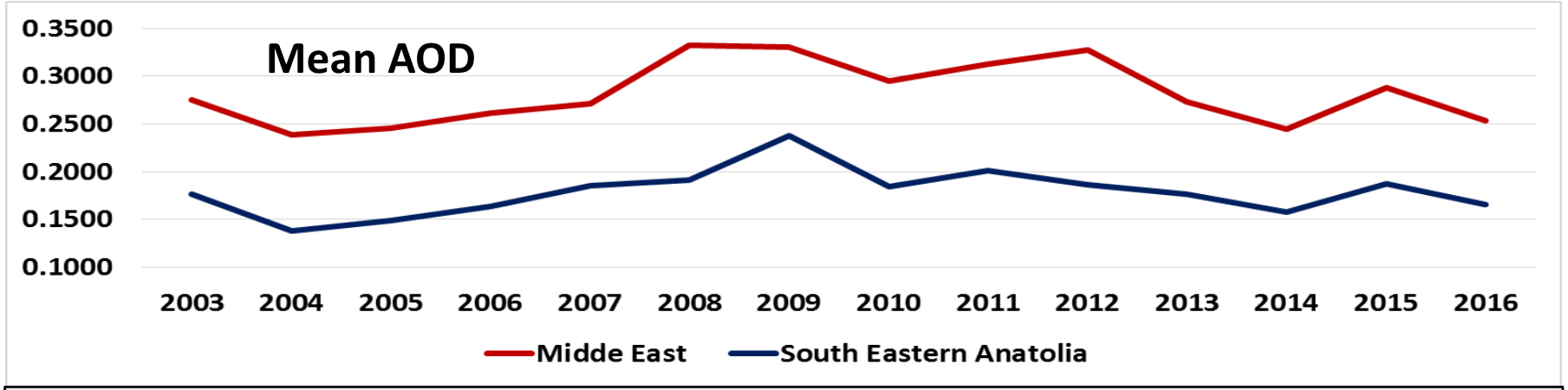


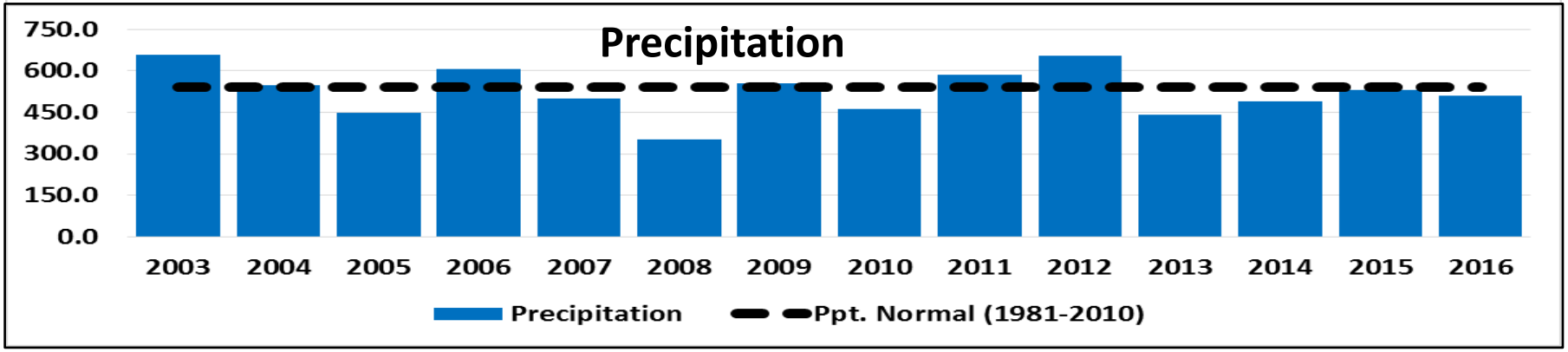
NASA Giovanni - Seasonal AOD Variation

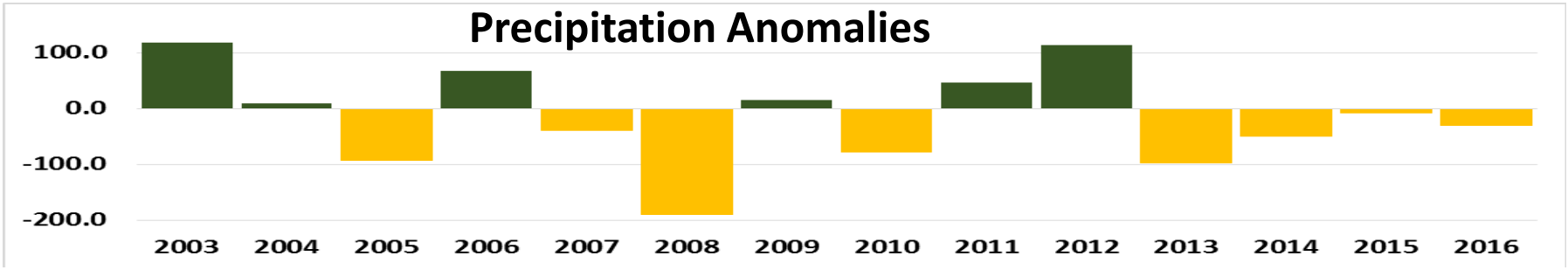
The highest AOD in the Northern and Central Middle East are in spring. On the other hand, the Southern Middle East exhibits a different seasonal pattern with a maximum AOD value in July.



AOD & Precipitation Analysis







Thank you for your attention...

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Turkish State Meteorological Service
Research Department

25-27 October 2017, Istanbul