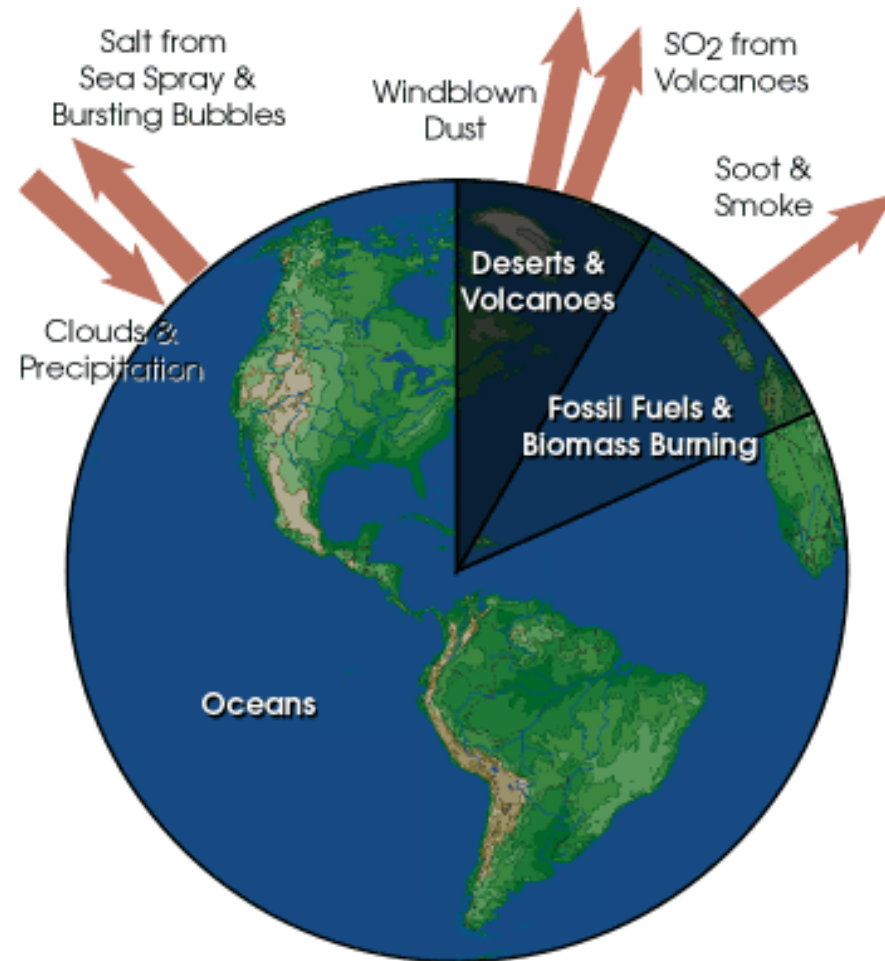


AEROSOLS

Fifth ICTP Workshop on Theory and Use of
Regional Climate Models

What are Aerosols?

- 'Fine Particles suspended in the air'
- 'On average anthropogenic aerosols account for almost 10% of the total mass of aerosols'



Why do we care about Aerosols?

- They 'directly' tend to cool the Earth's surface
- They 'indirectly' change the precipitable and radiative properties of clouds

Aerosol scheme for RegCM4

- An improved scheme including:
 - -> Dust
 - -> SO₄
 - -> Simple organic and black carbon
 - -> Sea salt

Experimental Setup

- Period of simulation: Jan 1990 – March 1991
- Resolution setup = 60 km
- Domain: Lat(9 S – 24 N) : Lon(20 W – 40 E)

Control Run

-> Without Aerosol forcing

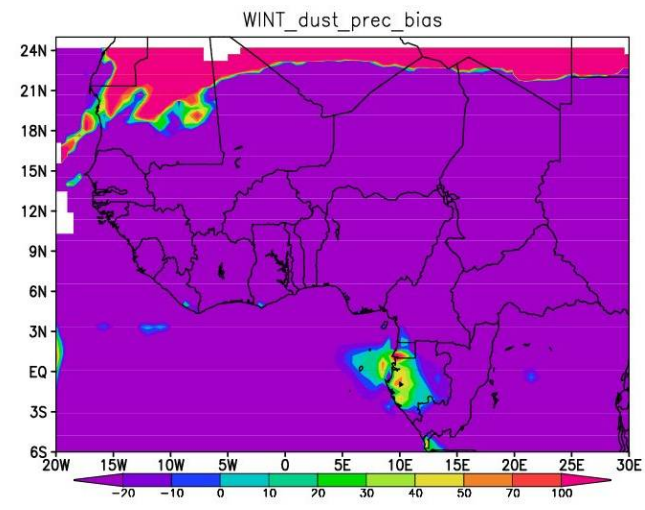
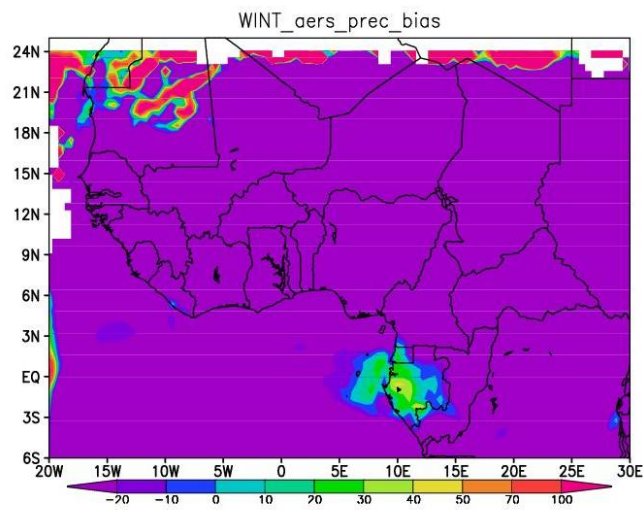
Aerosol Run

-> With all aerosol forcing

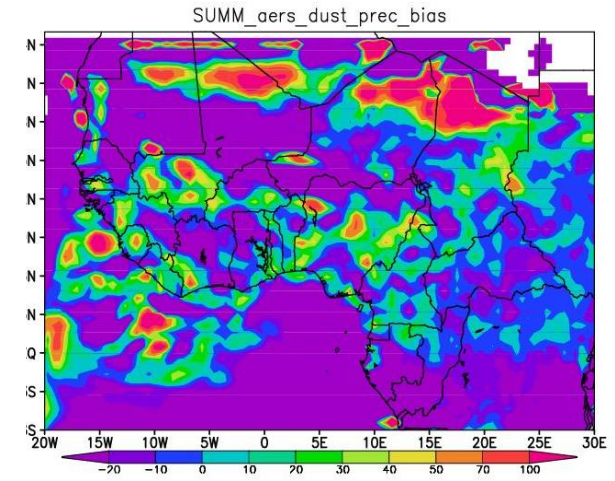
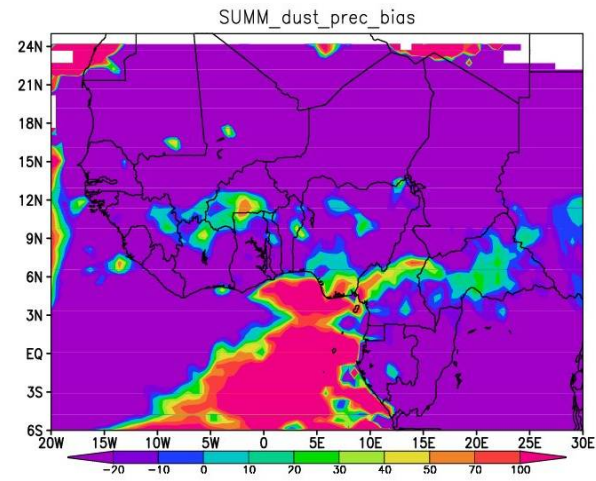
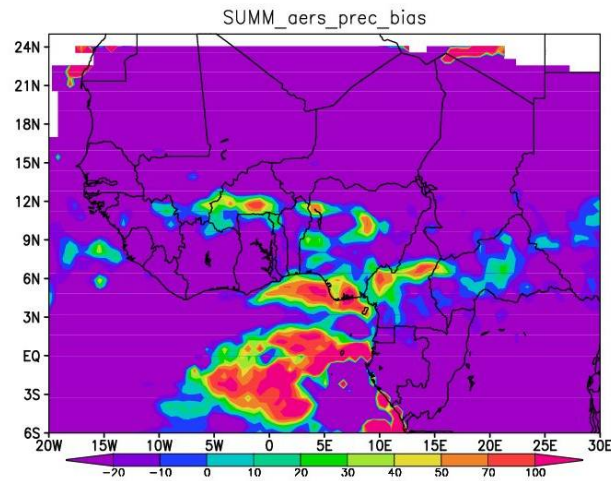
Dust only Run

-> With only dust forcing

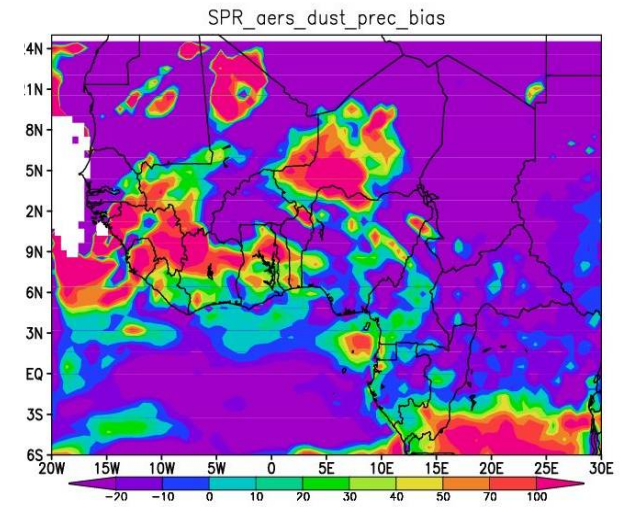
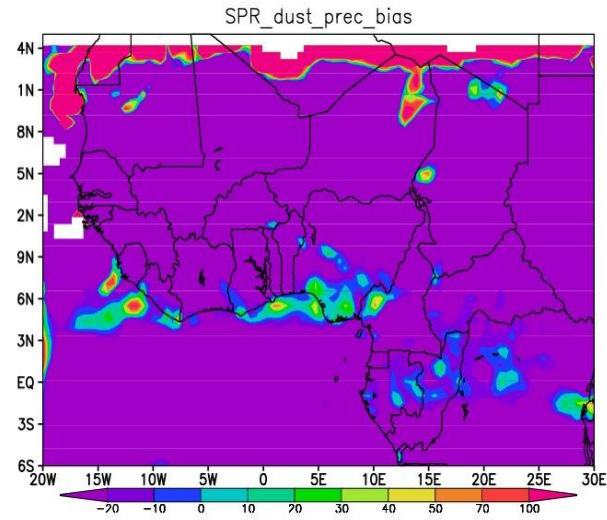
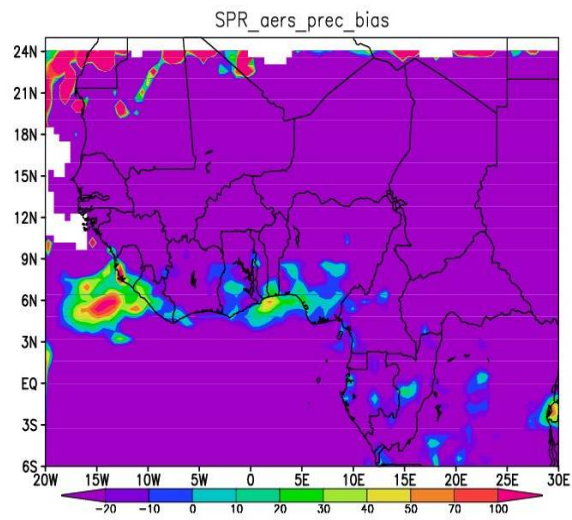
Winter Precipitation (mm/d) %Biases



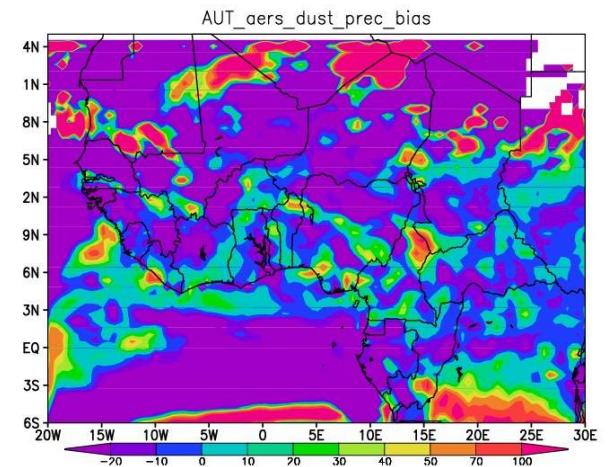
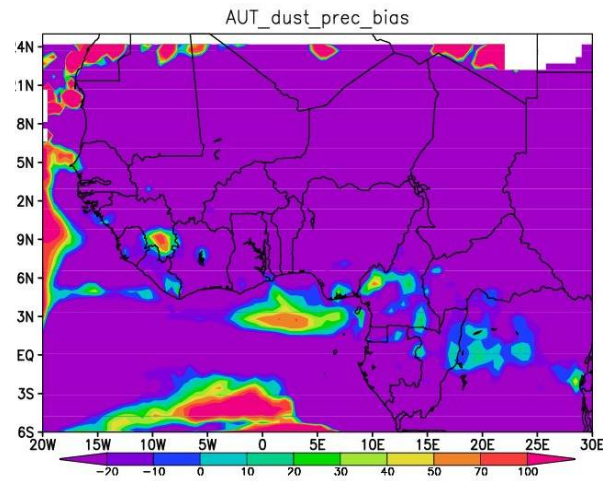
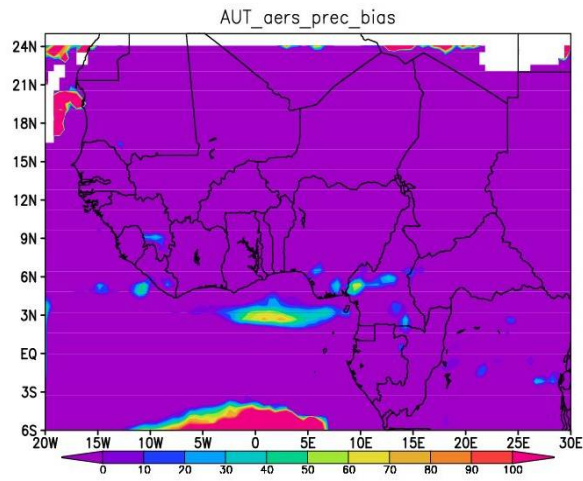
Summer Precipitation (mm/d) %Biases



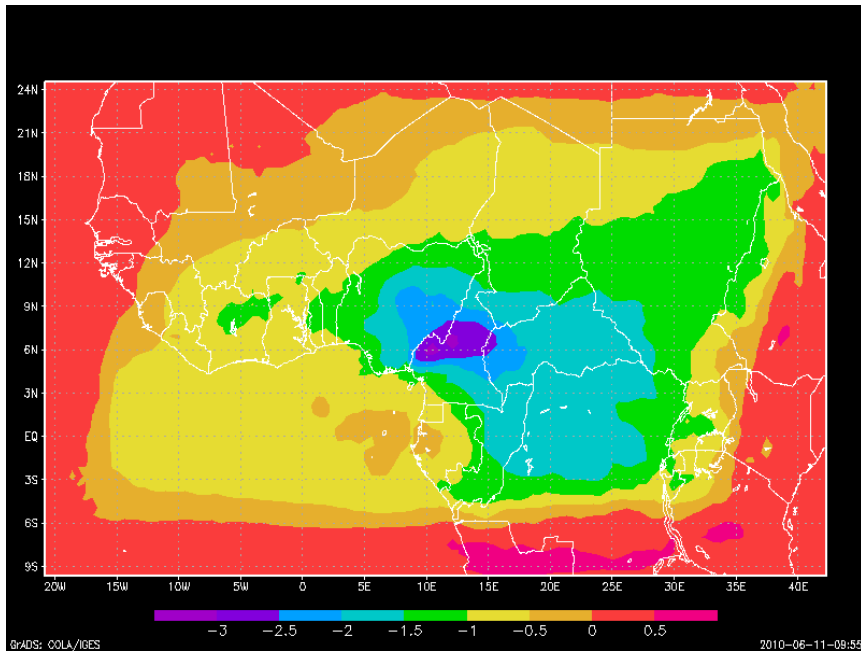
Spring Precipitation (mm/d) %Biases



Autumn Precipitation (mm/d) %Biases

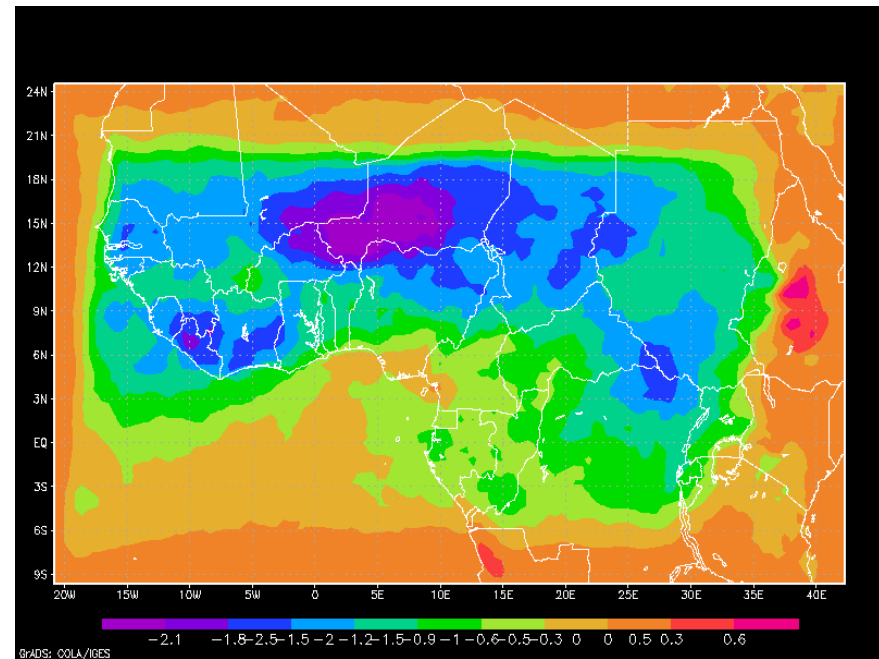


Seasonal Cloud Fractional Cover Biases

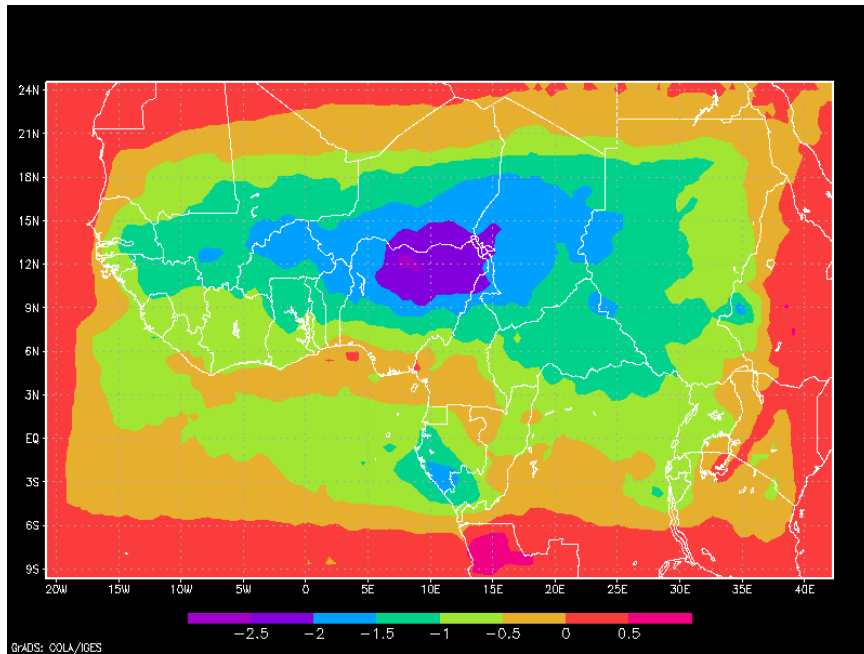


<- Winter (DJF)

Summer (JJA) ->

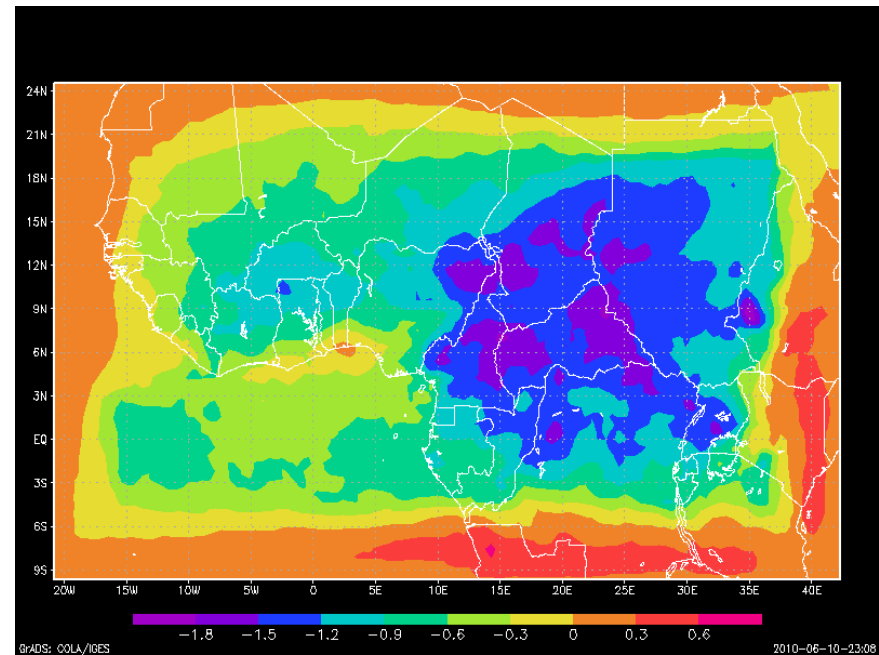


Seasonal Cloud Fractional Cover Biases



Spring (MAM) ->

<- Autumn (SON)



Conclusions

- The effect of aerosols over land and the ocean and coastal regions are different
- As expected the net effect of aerosols is to reduce precipitation, increase cloud cover land
- However there is an increase in precipitation over the ocean
- A small change due to aerosol forcing was observed only for the summer season
- BUT!
- We have to consider the theory also.

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