‘Fine Particles suspended in the air’

‘On average anthropogenic aerosols account for almost 10% of the total mass of aerosols’

Hardin and Kahn, NASA Earth Observatory
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

Summer (JJA) → Winter (DJF)
Seasonal Cloud Fractional Cover Biases

- Autumn (SON)

Spring (MAM) ->
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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