Sensitivity of Aerosols Over the South Asia

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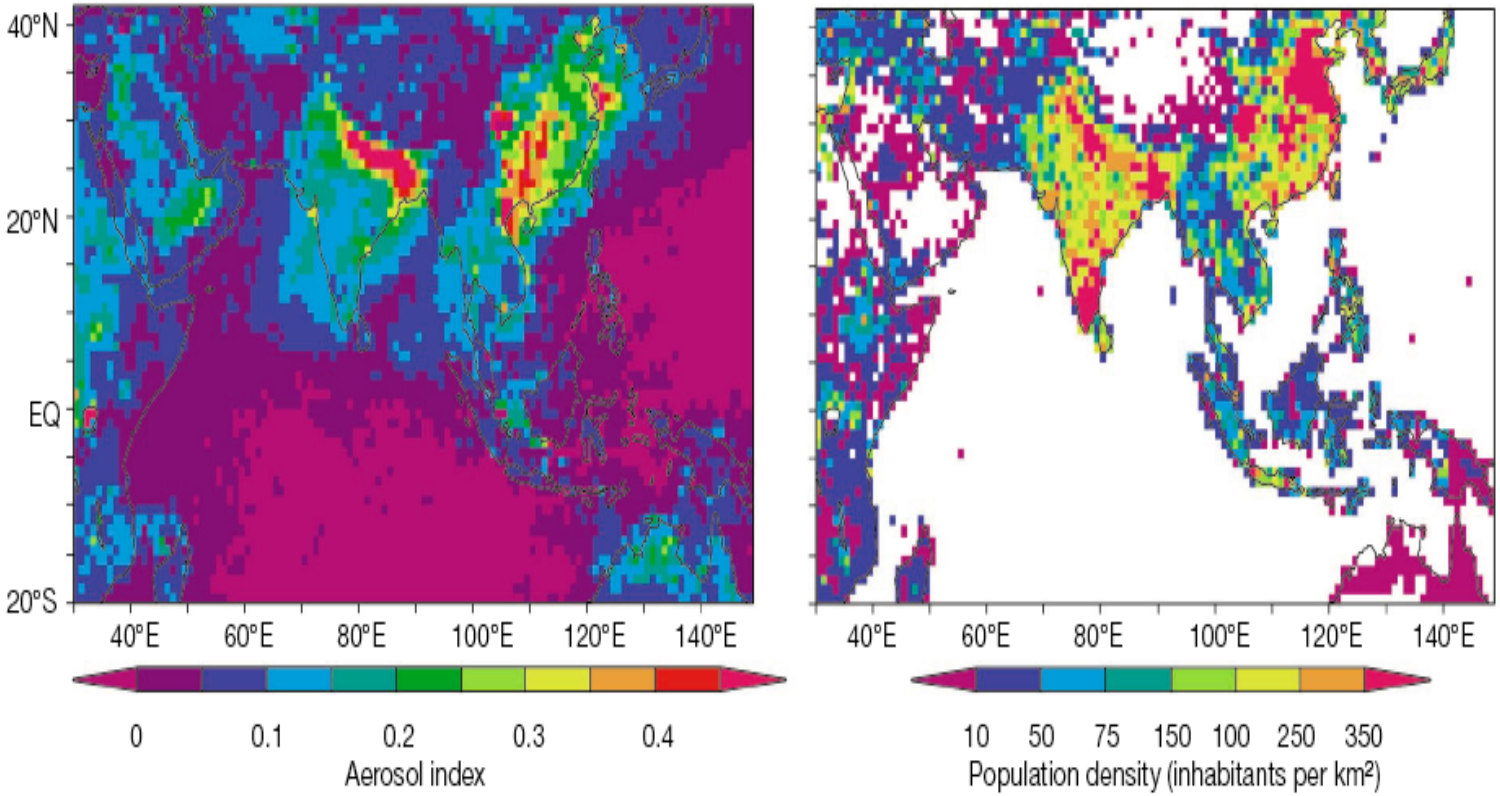
Why aerosol studies are important for South Asia?



POLDER aerosol index Feb. 1997 & population density (Kaufman, Tanré & Boucher, Nature 2002)

Aerosol studies over the South Asia: Bollasina and Nigam 2008, Massimo et al. 2011, Nair et al. 2012 ……

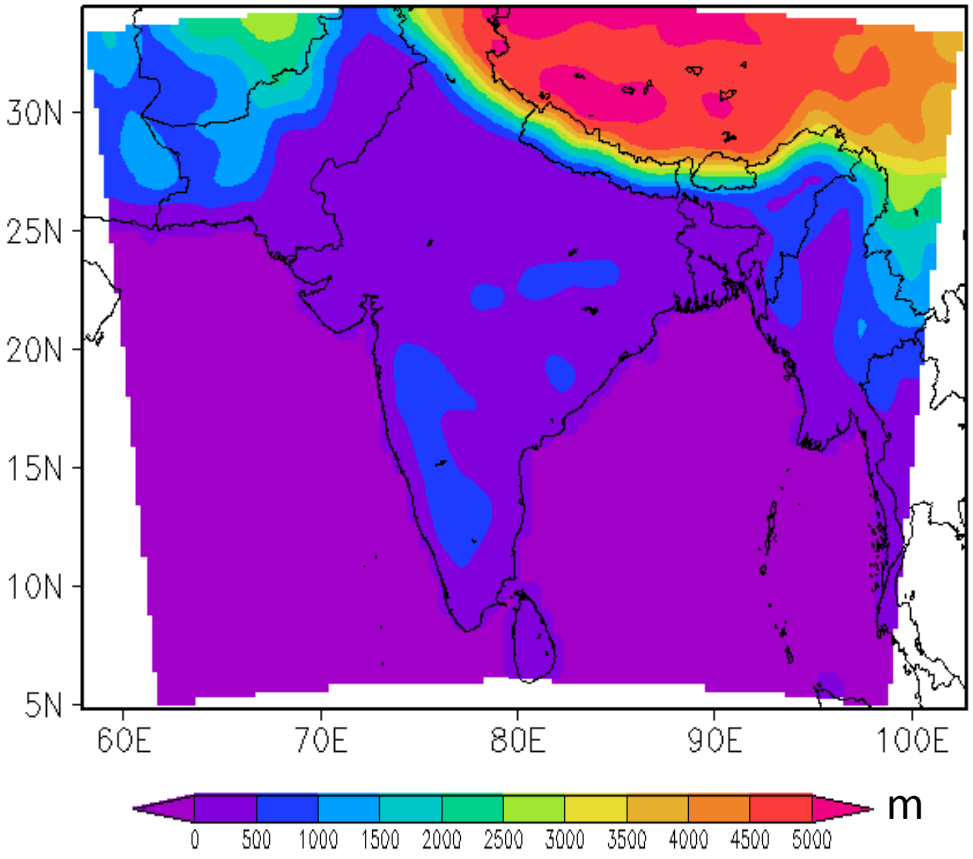
Objective

To examine the aerosols on South Asia during summer and winter seasons using RegCM 4.3

Simulations

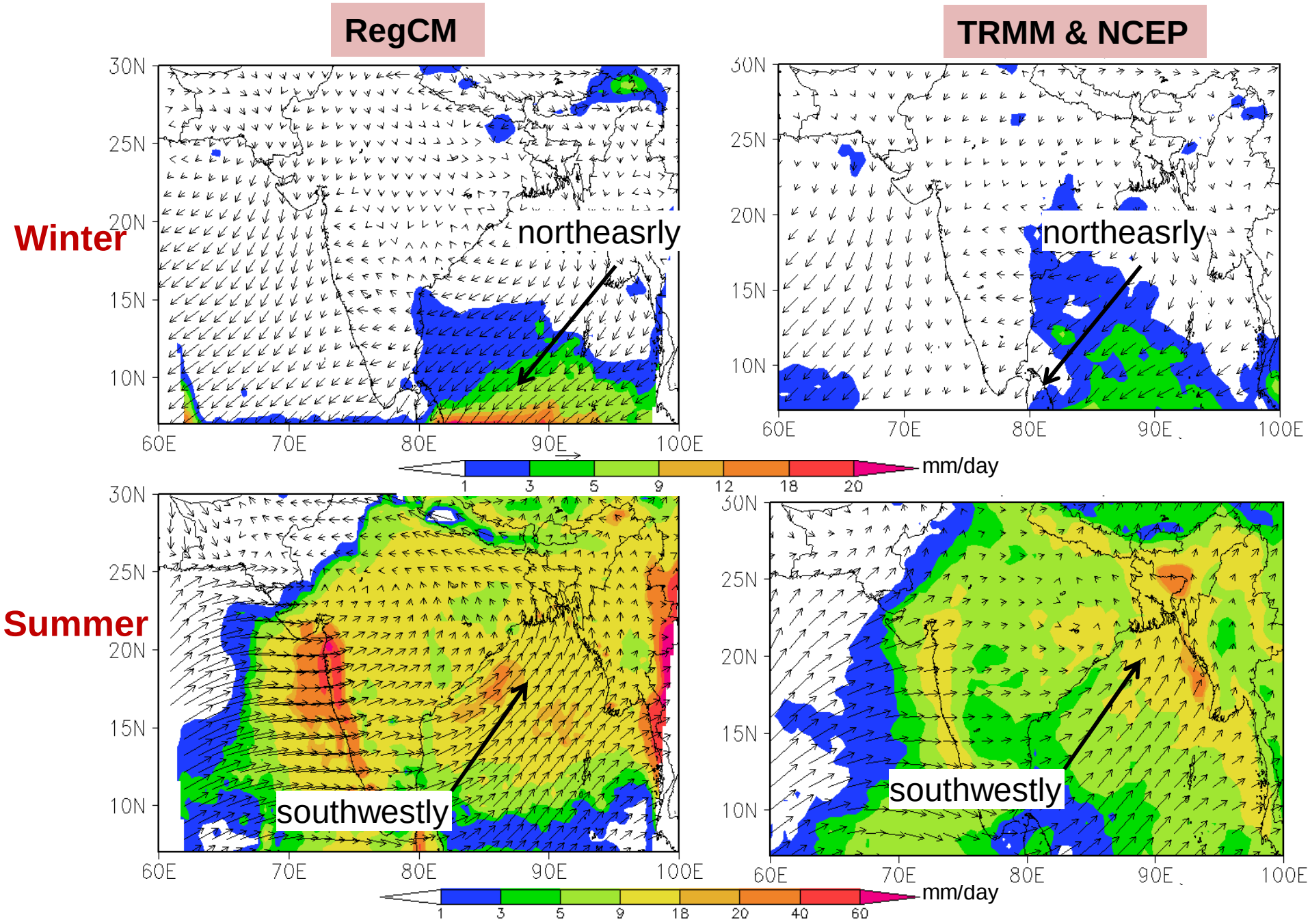
- ✓Winter Season: Dec 2003 to Feb 2004
- ✓Summer Season: July 2004 to Sep 2004

Model Setup



Simulation Period	**3 months**
Grid Resolution	60 km
Computational Domain	4320 km x 3300 km
Vertical Level	18
Convection Scheme	Grell
Cumulus Closure Scheme	Fritsch and Chappell
ICBC	ERAINT 6hr data
Aerosol Type	AER11D1
Chemical Control	AERO
Emission Scenario	RCP2.6

Precipitation



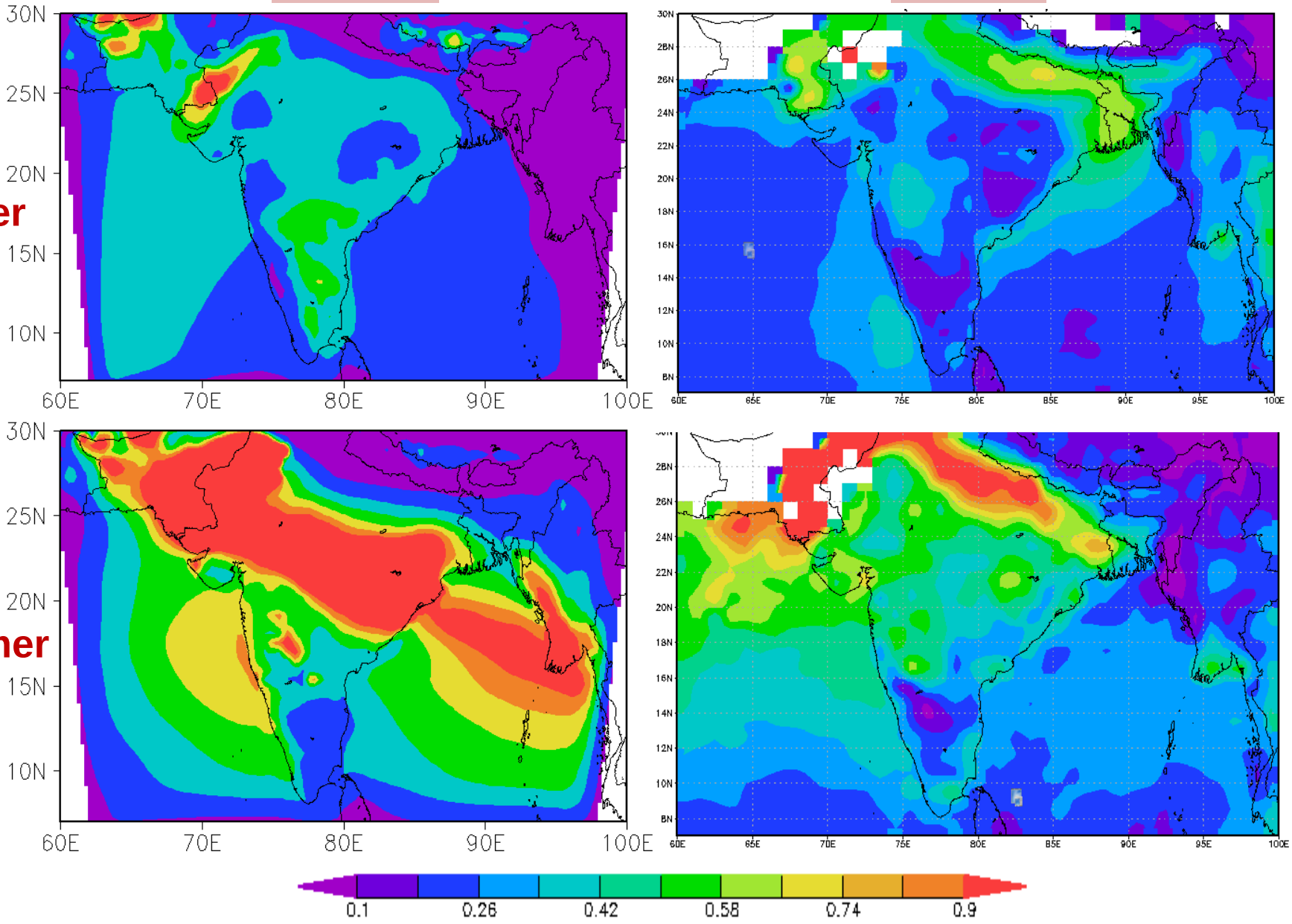
AOD

RegCM

MODIS

Winter

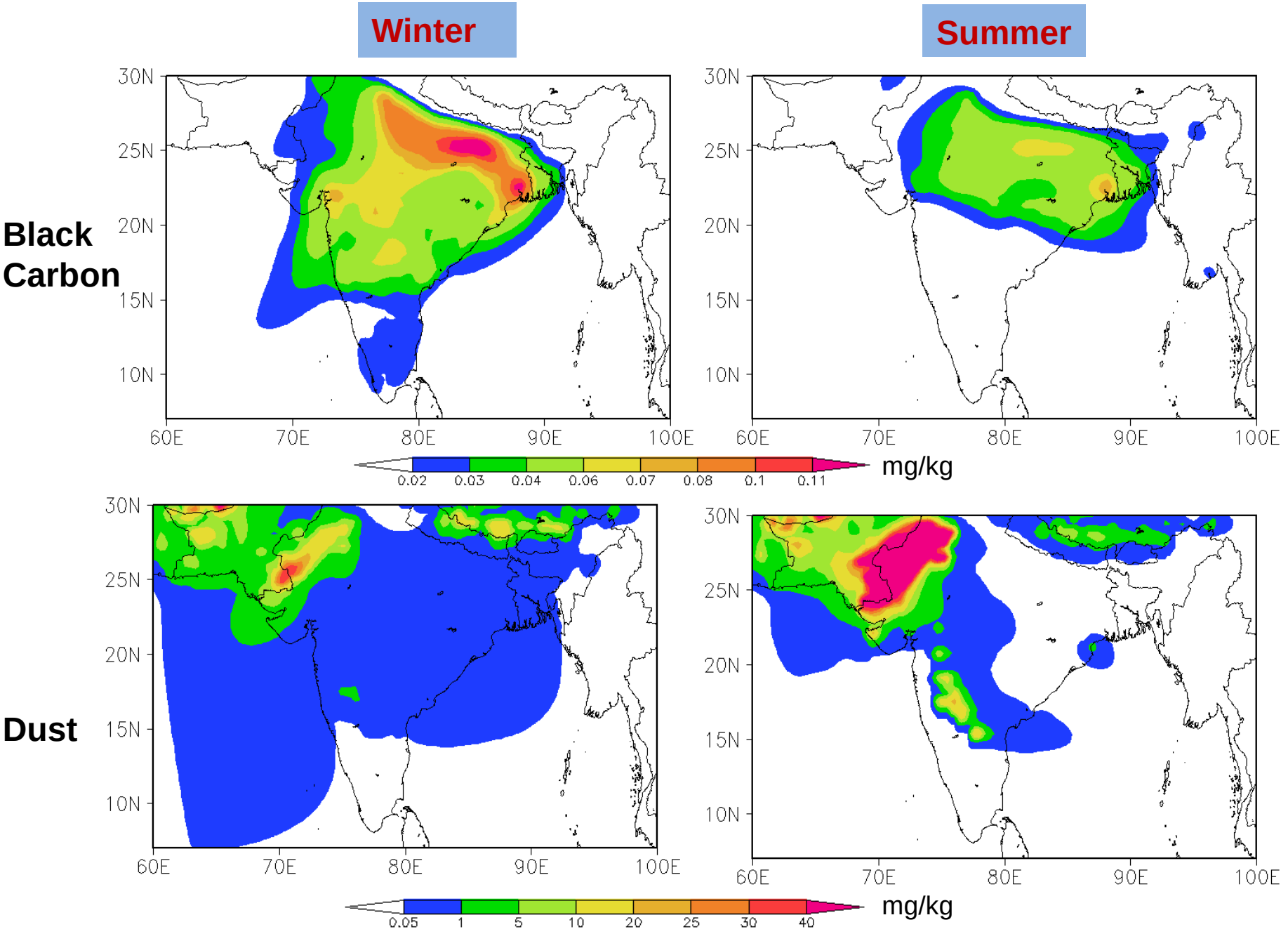
Summer



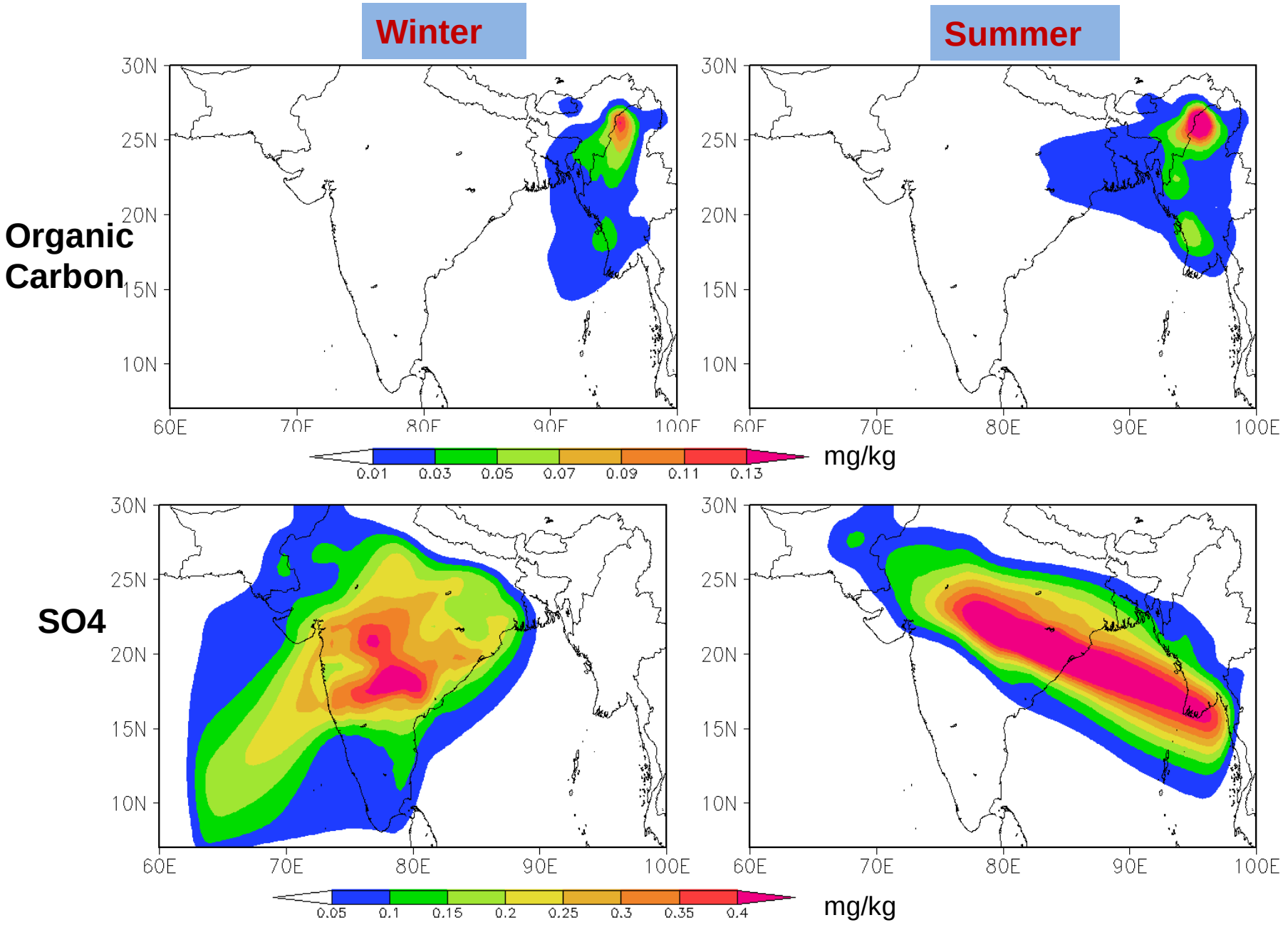
Different types of aerosols

- Dust
- Black Carbon
- Organic Carbon
- Sulfate (So4)
- Sea Salt

Distribution of aerosols

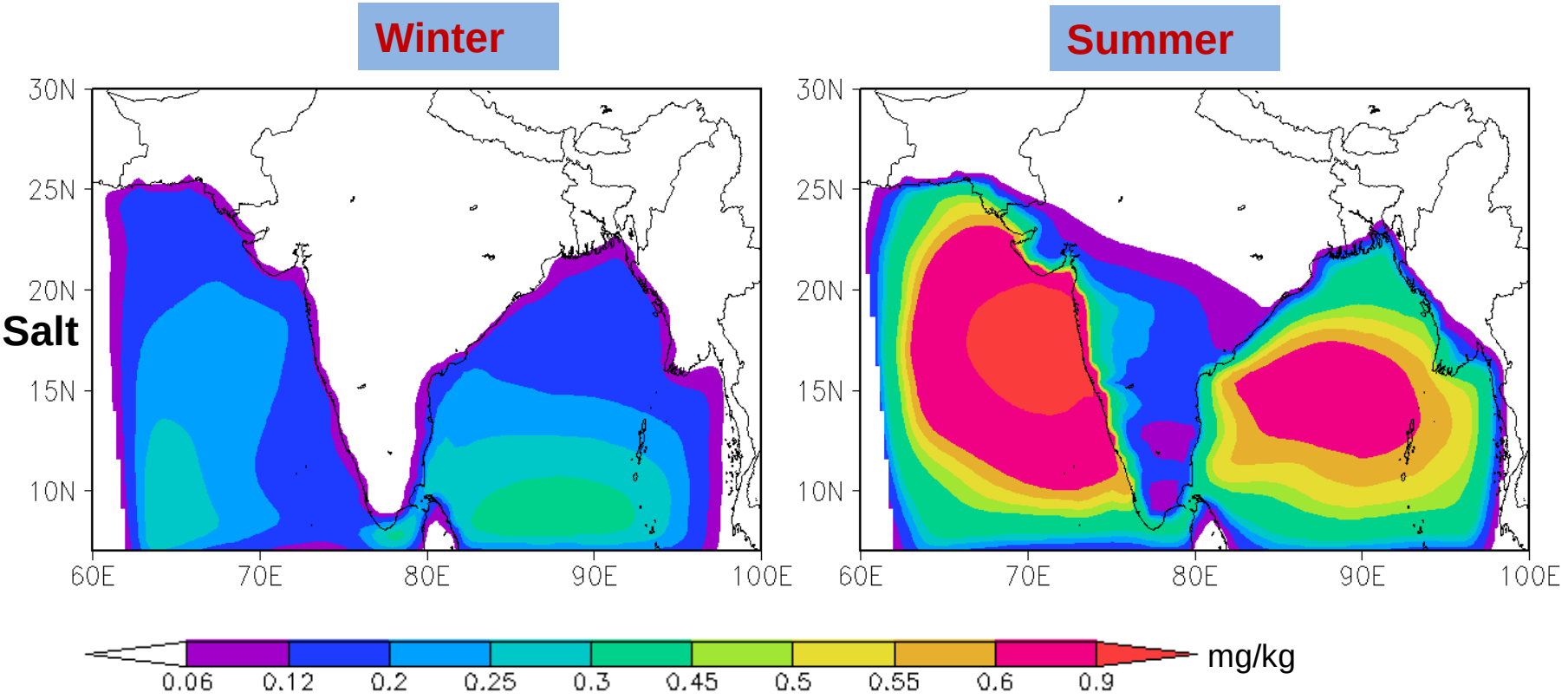


Distribution of aerosols

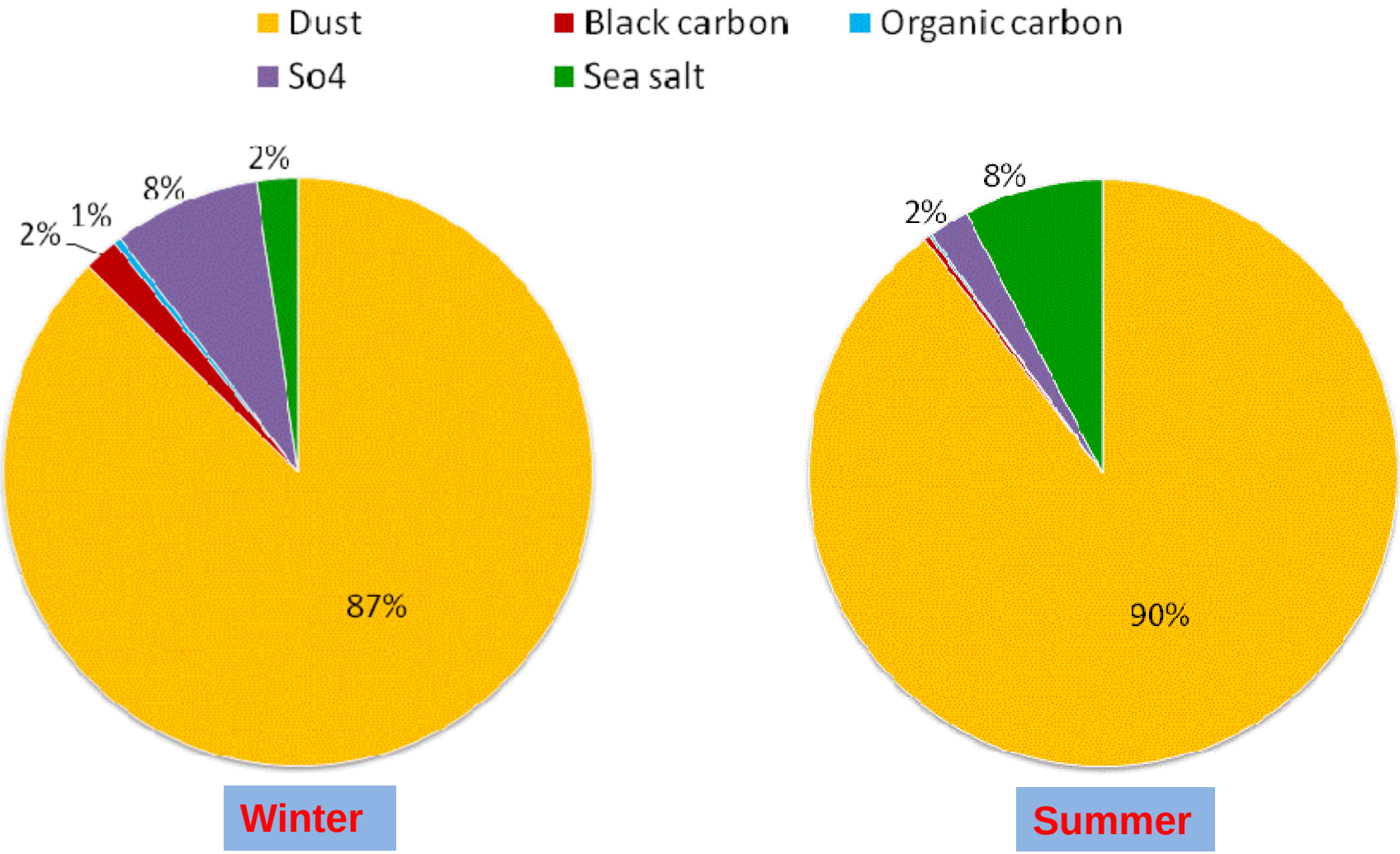


Distribution of aerosols

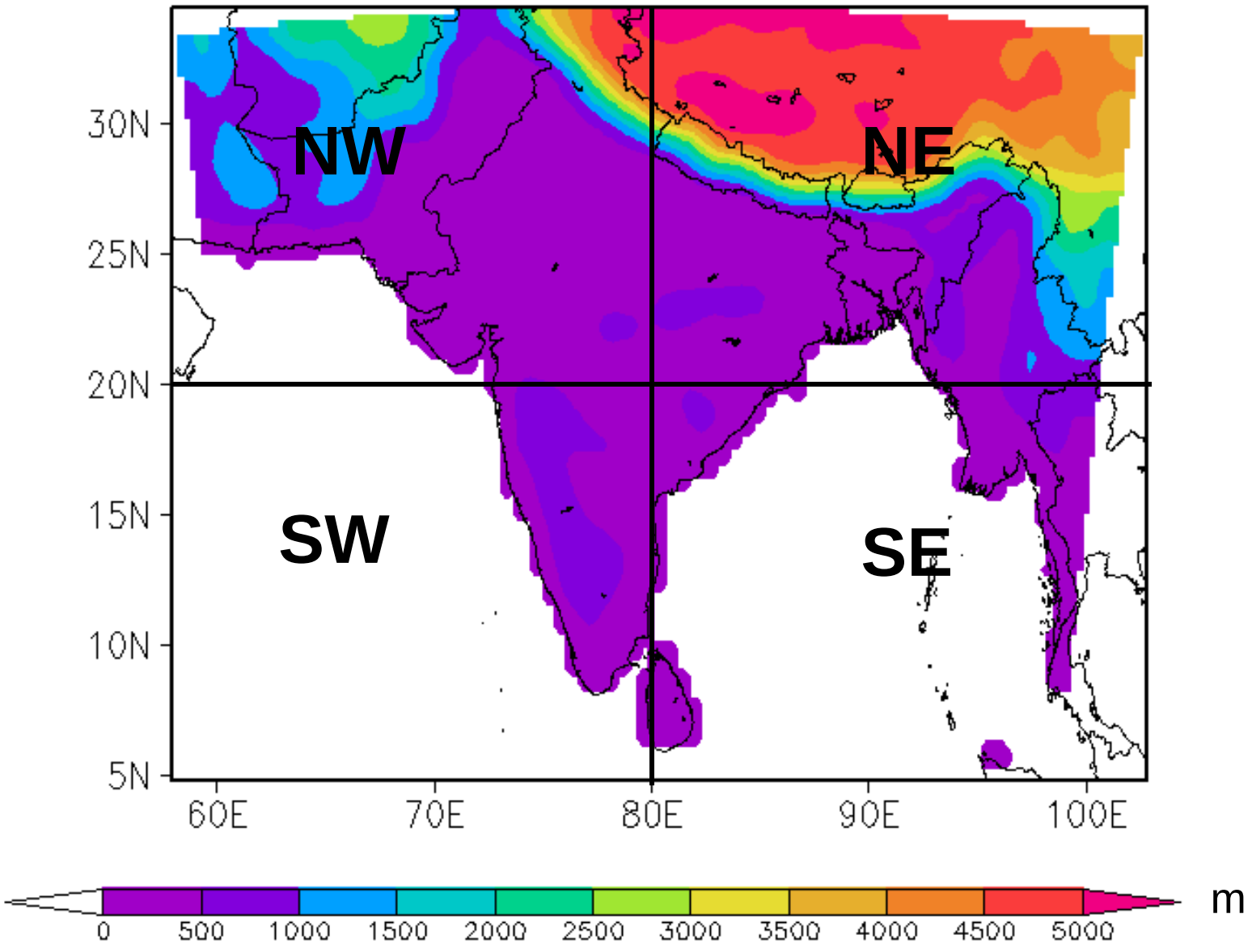
Sea Salt



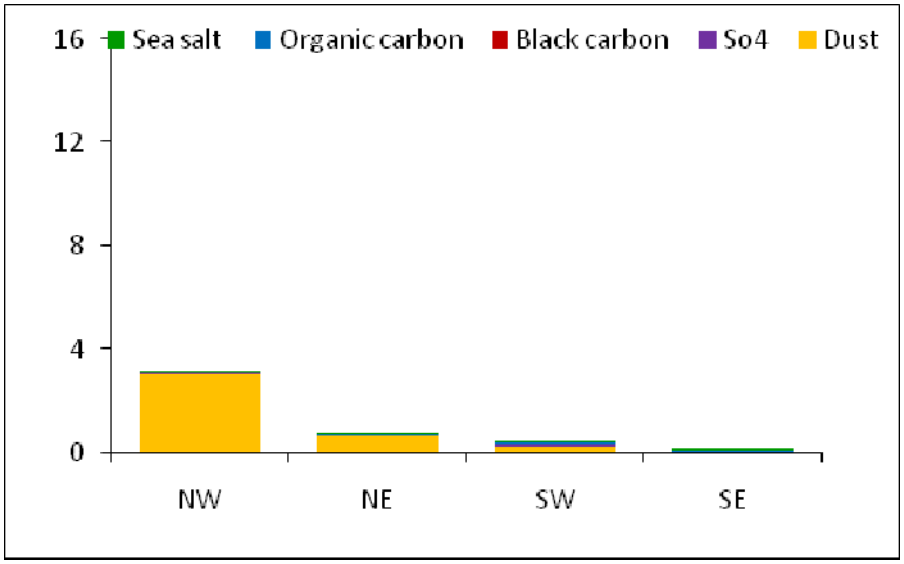
Concentration of various type of aerosols



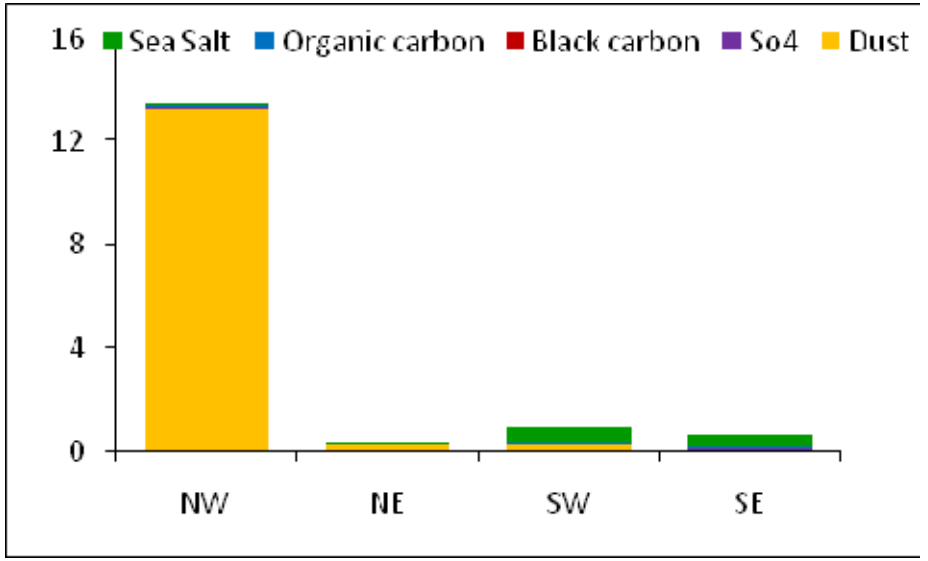
Dust is the main source of aerosol during both summer and winter. But in winter season, other aerosol particles are more than summer except sea salt


NW
NE
SW
SE
30N
25N
20N
15N
10N
5N
60E
70E
80E
90E
100E
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
m

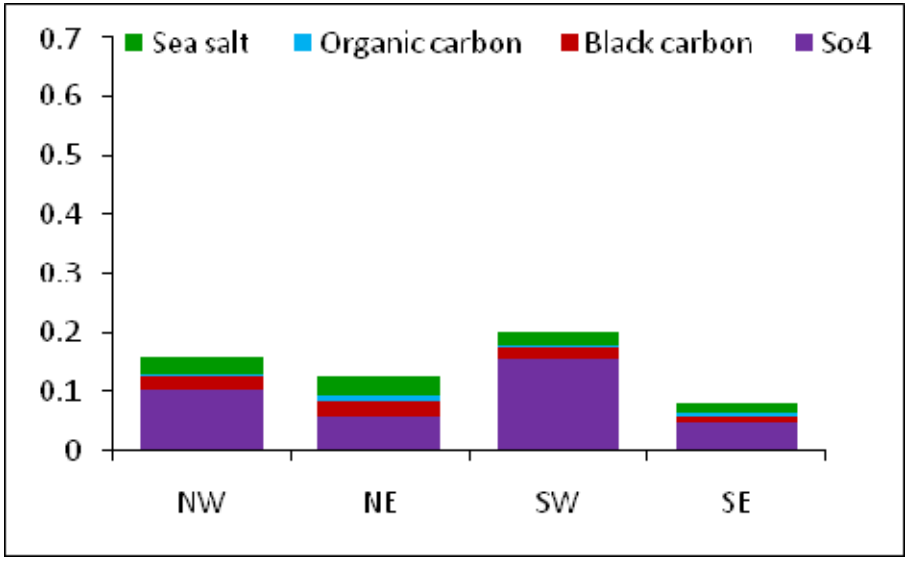
Winter

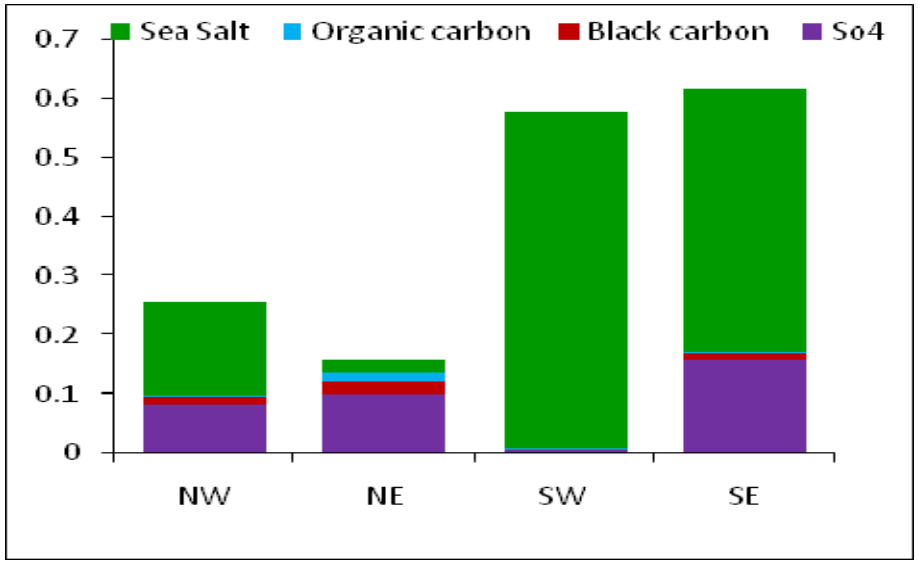


Summer



without dust





Conclusion

- Model simulated well in terms of precipitation, wind, AOD during both summer and winter seasons

- South Asian summer season has more aerosols than winter

- According to model result, dust is dominating in both the seasons and higher in NW area of South Asia

- SO4 is present in almost all area during winter season whereas sea salt is more in summer season because of intense sourthwestly wind.