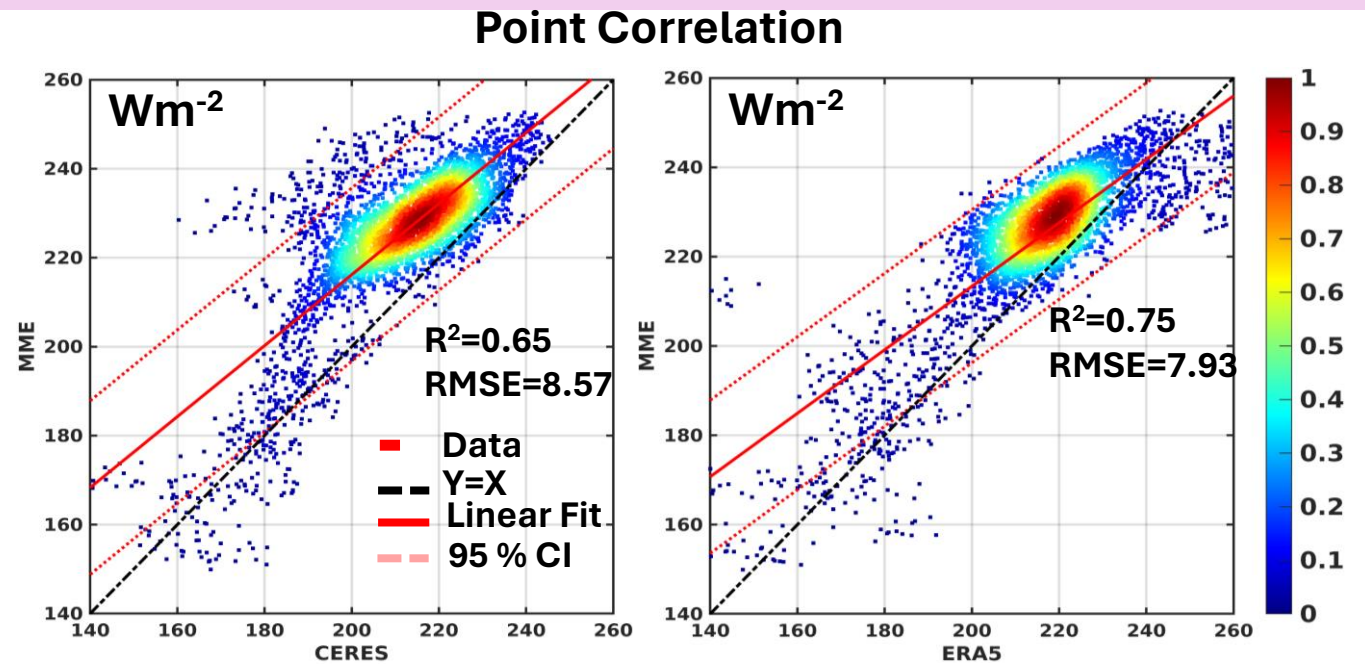
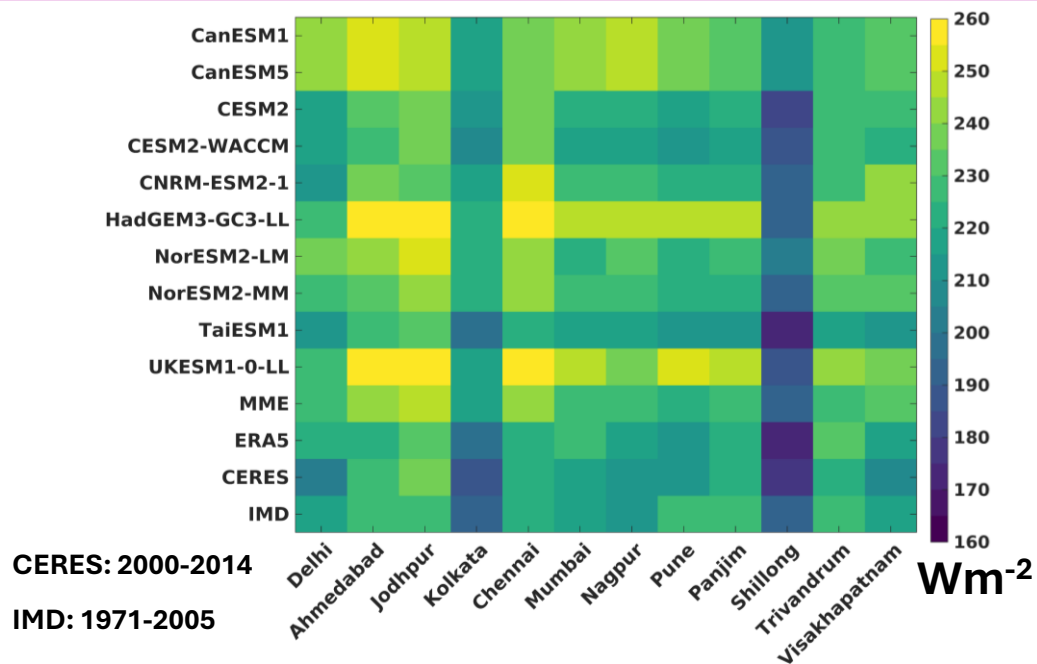


Assessing the future solar resources over India at 1.5°C and 2°C warming worlds

Sushovan Ghosh, Dilip Ganguly and Sagnik Dey

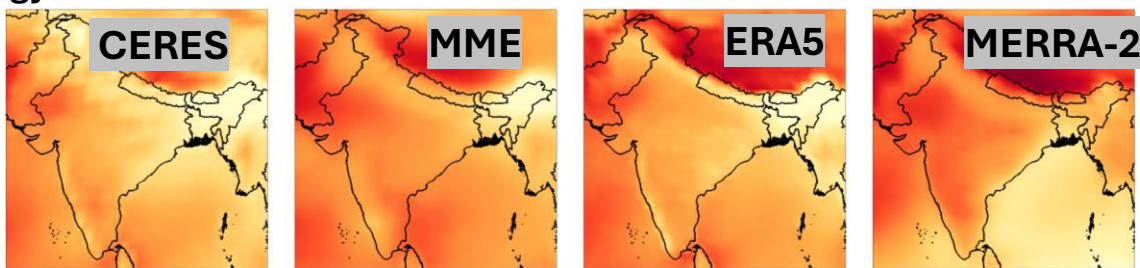
Email: *Sushovan.Ghosh@cas.iitd.ac.in*

Comparison with Observations and Reanalysis

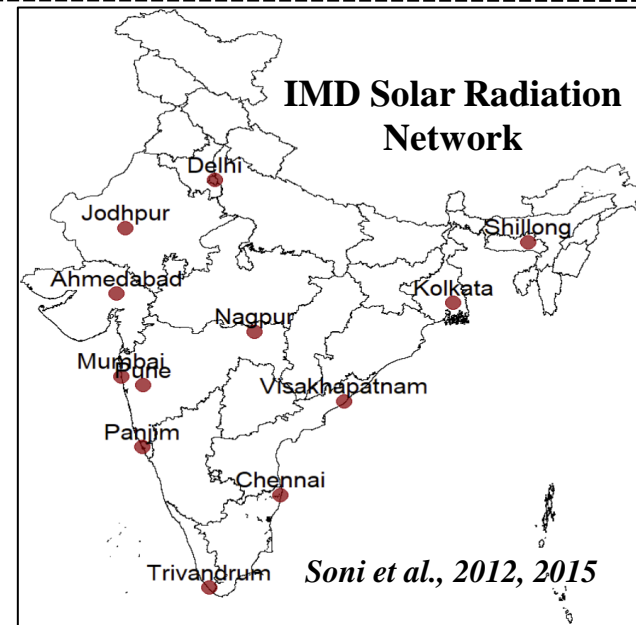
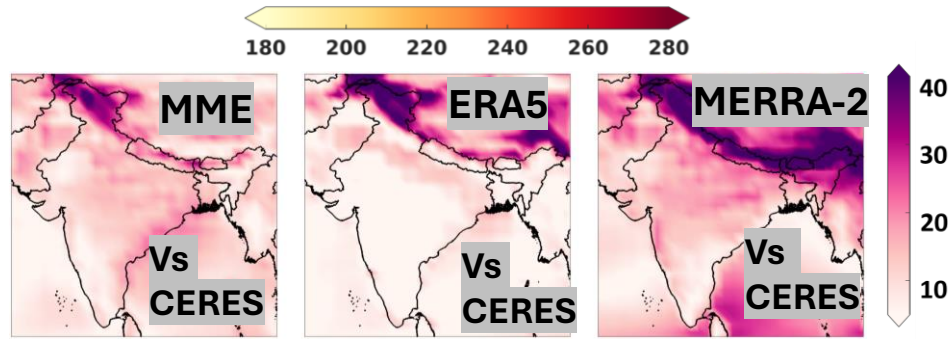


Climatology
(Wm^{-2})

2000-2014

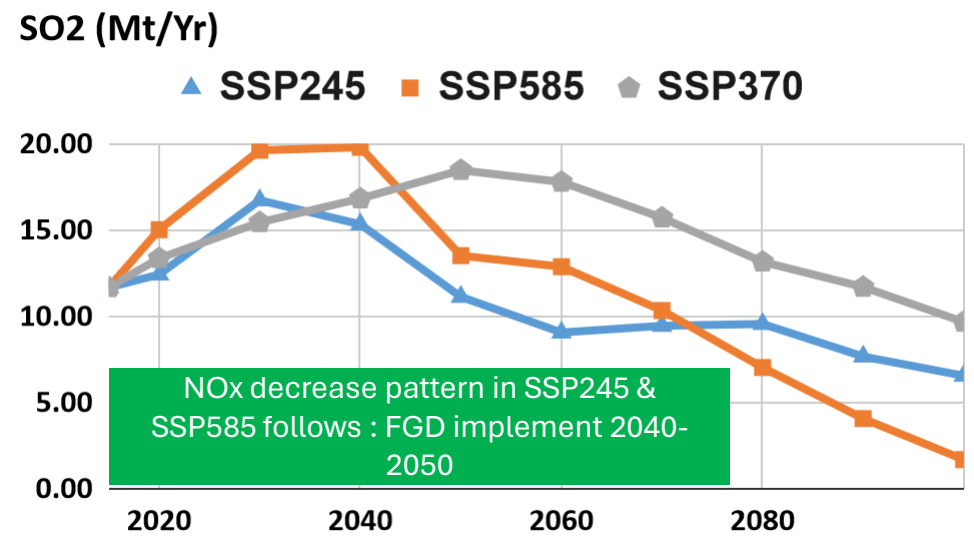
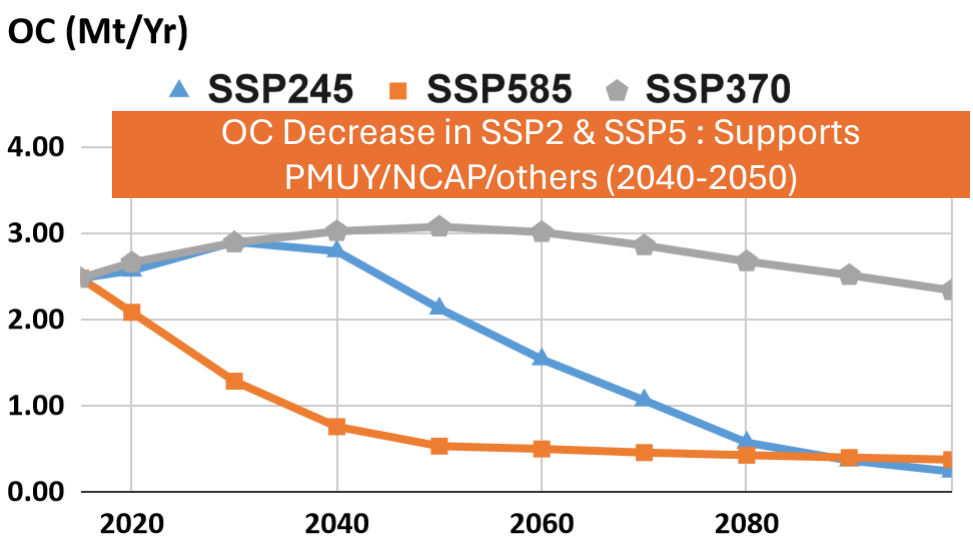
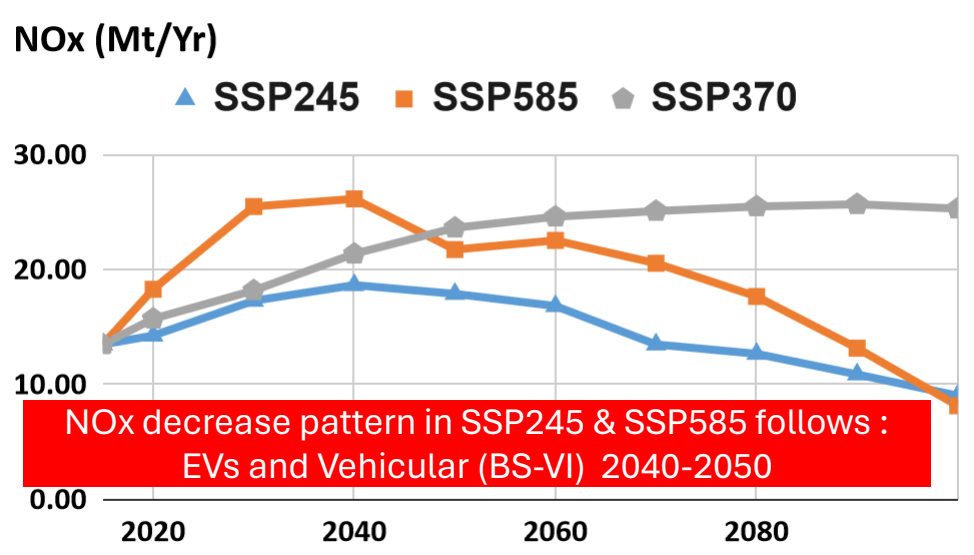
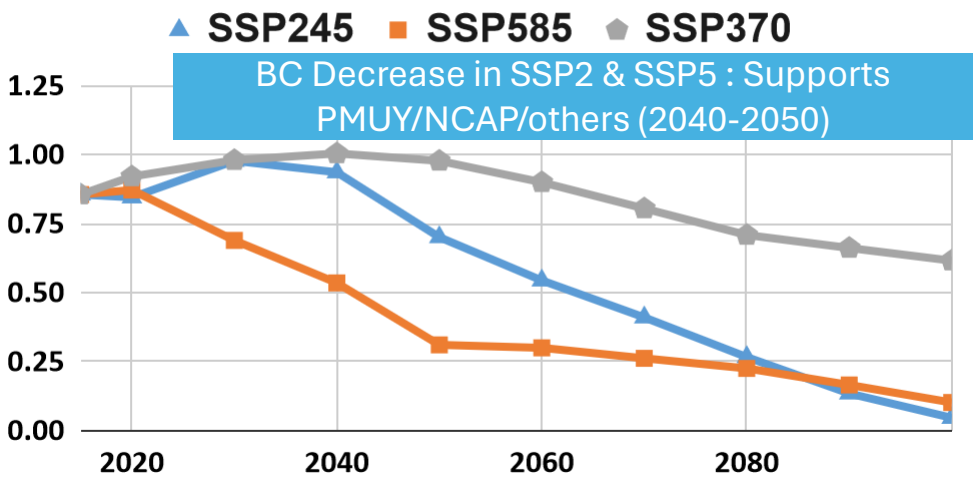


RMSE (Wm^{-2})



Variable: Surface solar irradiance :
1985-2014

Why SSP 245 & SSP585 ?



SSP1: is un-realistic with respect to global context. (Discarded)

Air pollution mitigation policies: PMUY, NCAP, EV & FGD for Power Plants

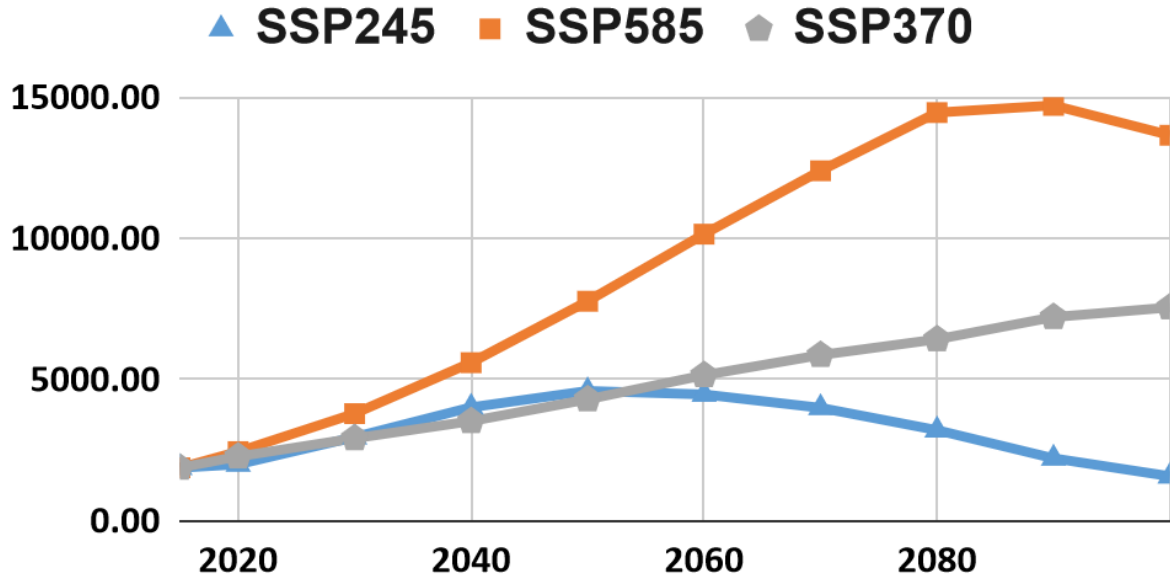
SSP3 (SSP4, not shown here) do (es) not show any decreasing pattern of air pollutant over Indian region around mid century. Therefore, SSP3 & SSP4 are unrealistic to Indian context. (discarded)

Single SSP could not justify plausible futures. Moreover, SSPs are designed for global context.

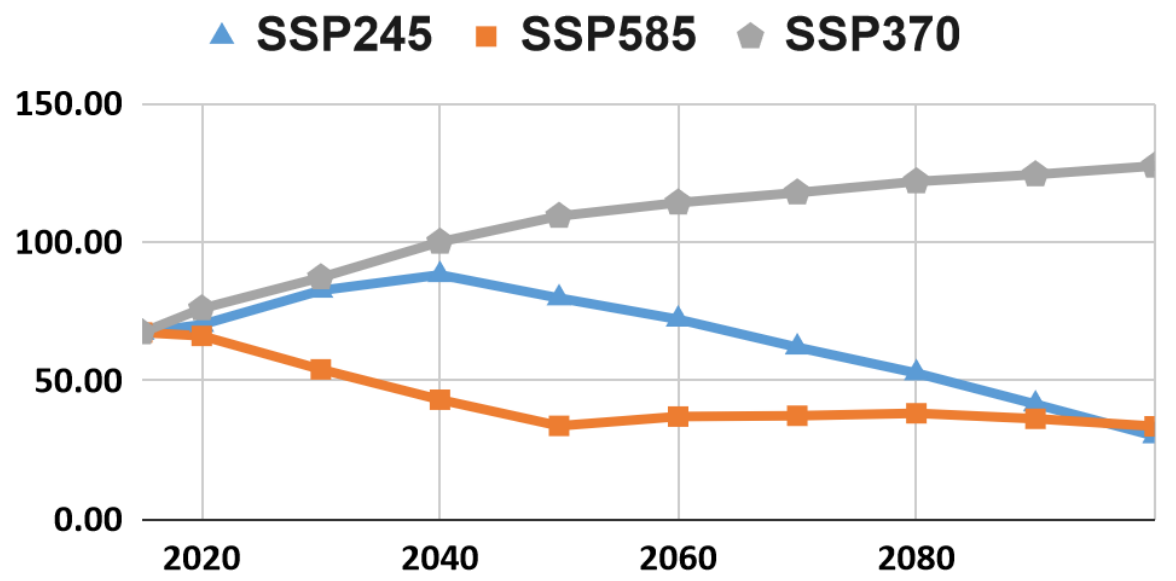
SSP585: strong air pollutant mitigation and SSP245: Intermediate air pollutant mitigation around mid-century. Both are showing decreasing air pollutant around mid-century. (more realistic for Indian context).

There is no Single BAU in SSPs. However, as per SSP narratives are concerns . "In SSP245 follows hist. patterns"

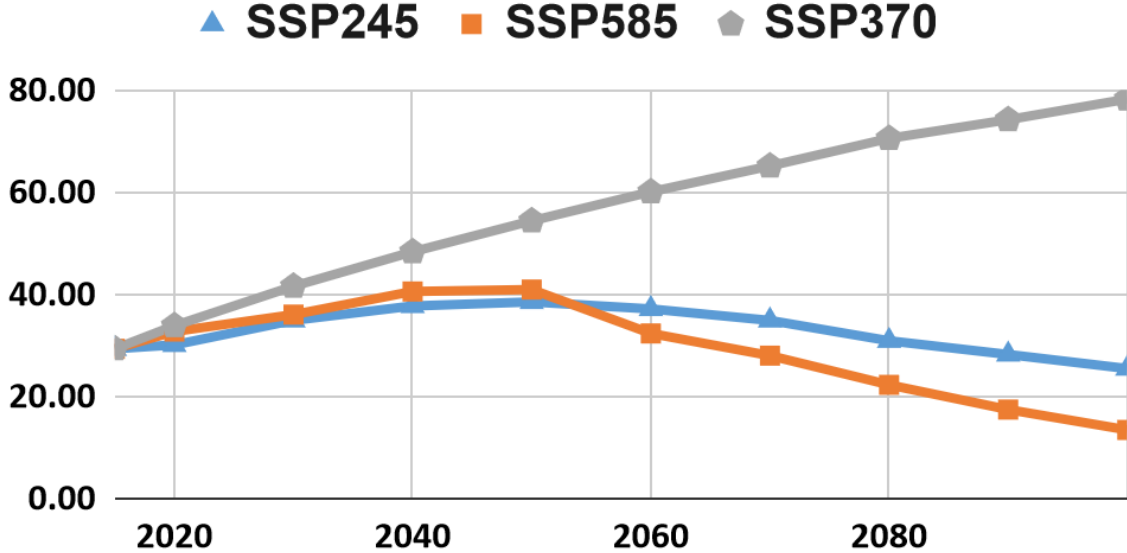
CO2 (Mt/Yr)



CO (Mt/Yr)



CH4 (Mt/Yr)

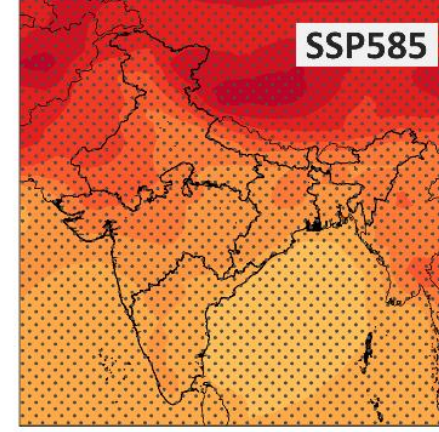
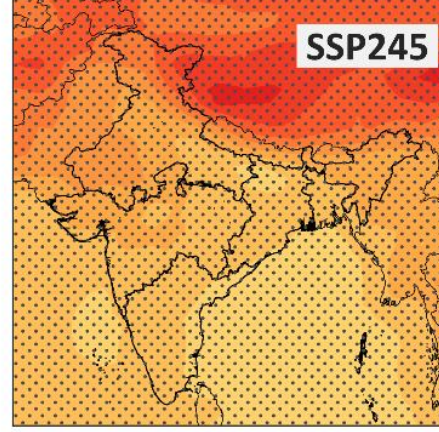
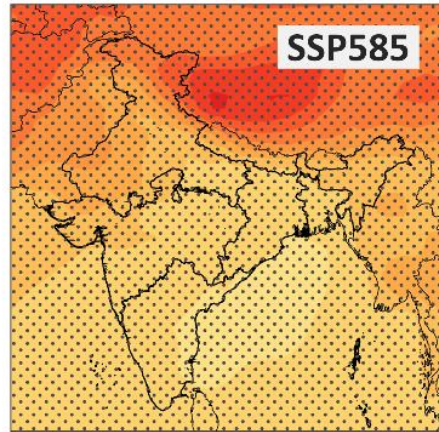
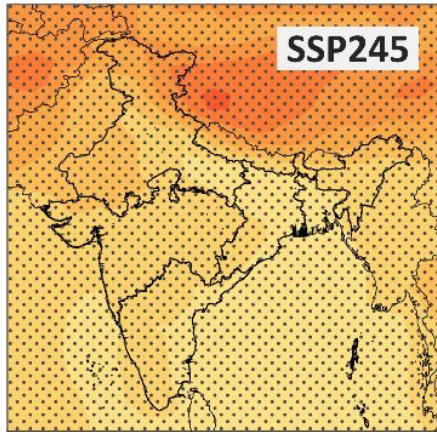


Change in Temp & Wind speed

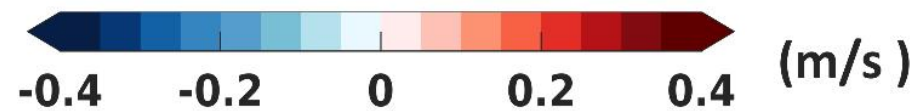
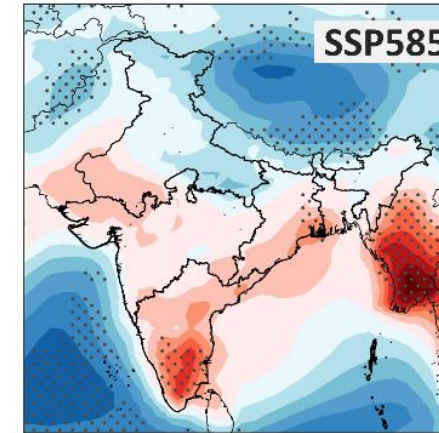
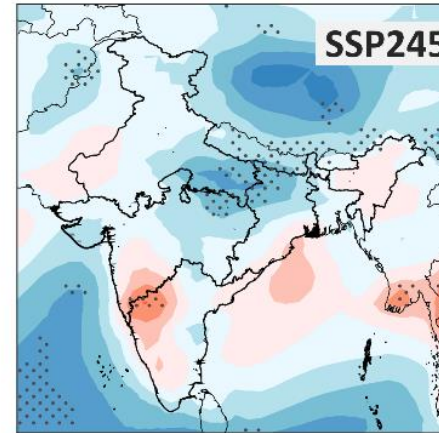
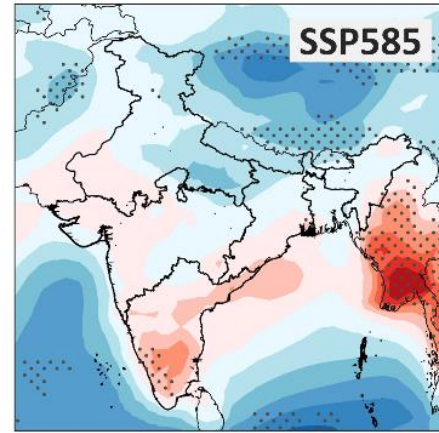
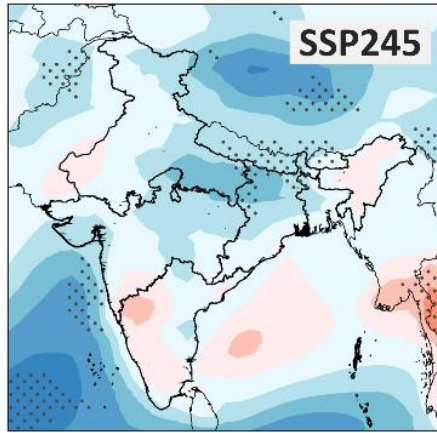
GWL: 1.5°C

GWL: 2°C

(TS)

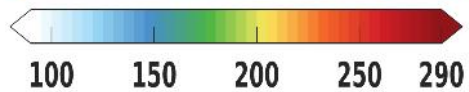
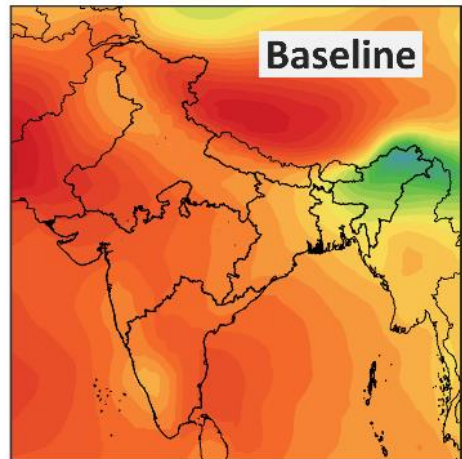


(WS)



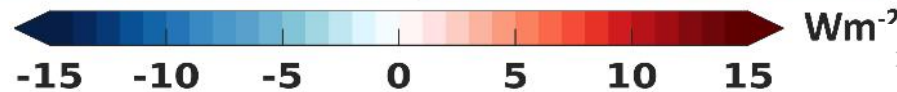
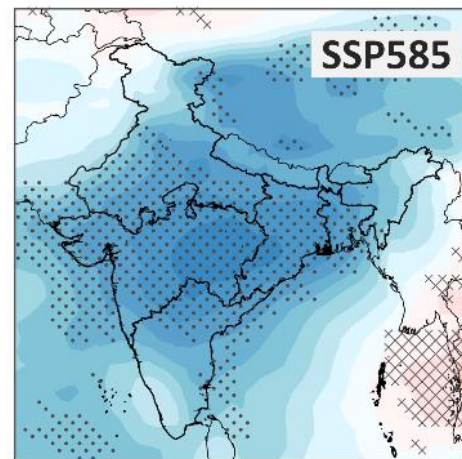
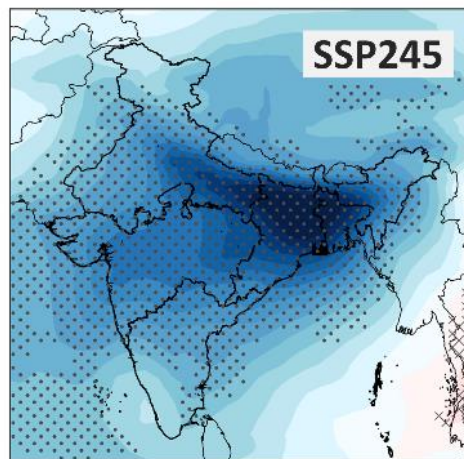
Resource availability and variability

Hist. (RSDS)

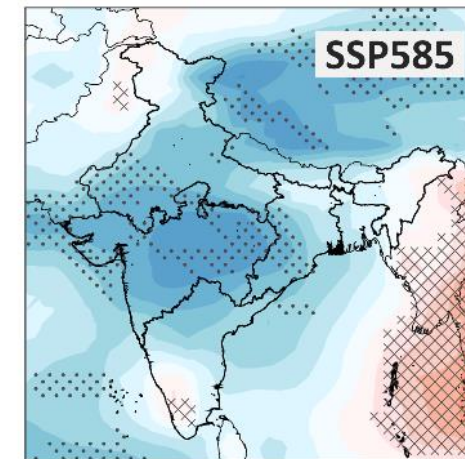
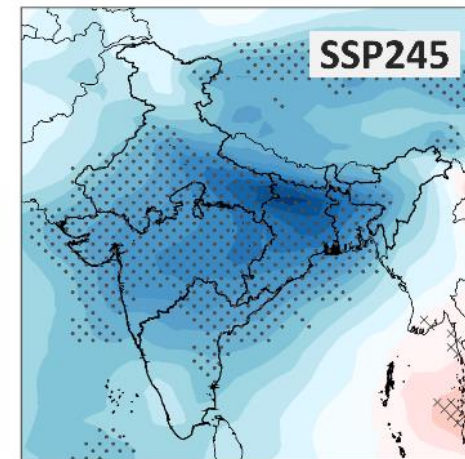


Wm⁻²

GWL: 1.5°C



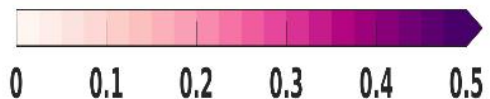
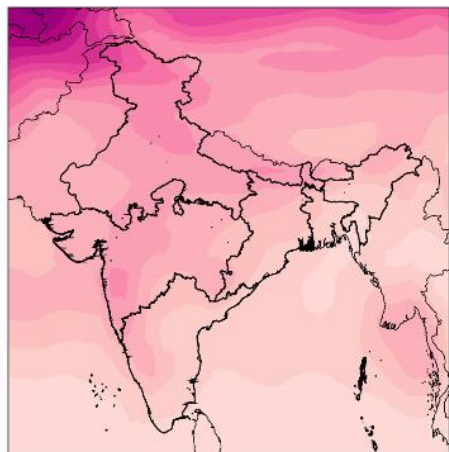
GWL: 2°C



$$\text{RCoV} = \frac{\text{median}(\text{absolute deviation about the median})}{\text{median}}$$

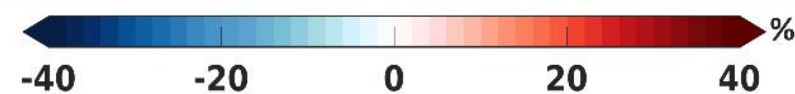
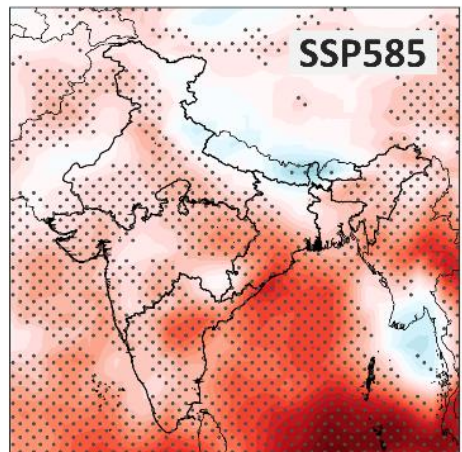
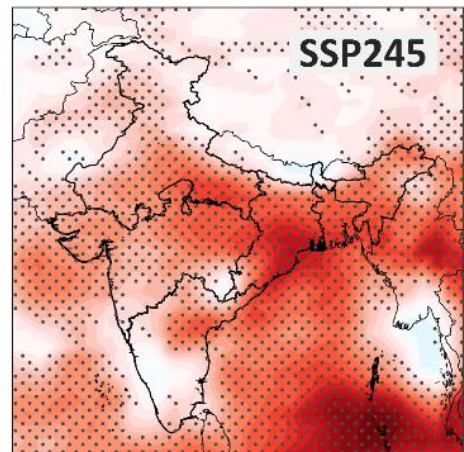
$$= \frac{\text{median}(|X_i - \bar{X}|)}{\bar{X}}$$

Hist. Coeff. Variation

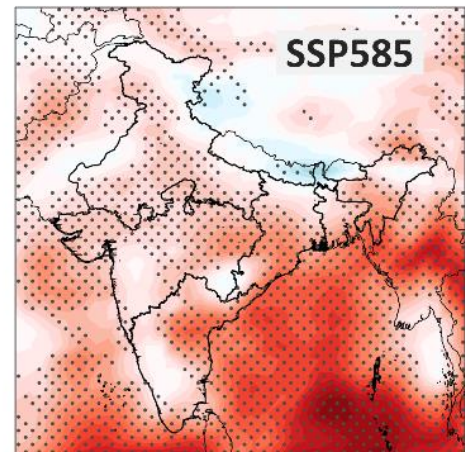
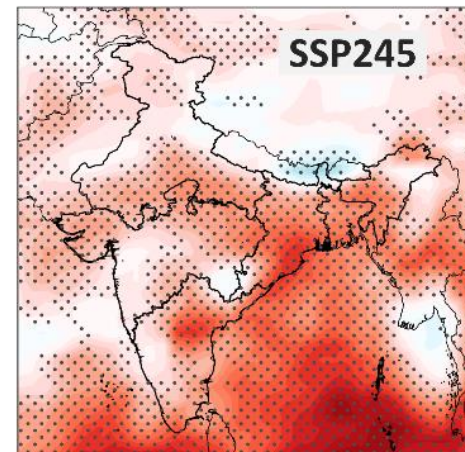


Unitless

GWL: 1.5°C

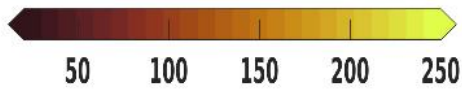
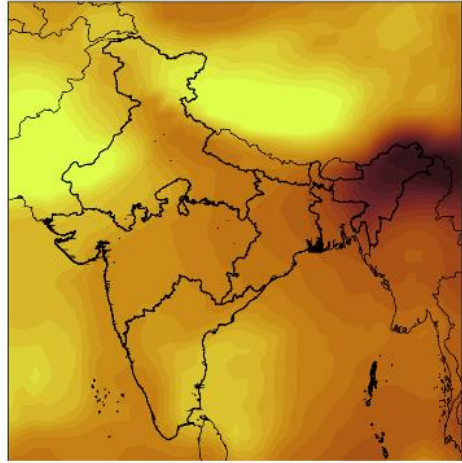


GWL: 2°C

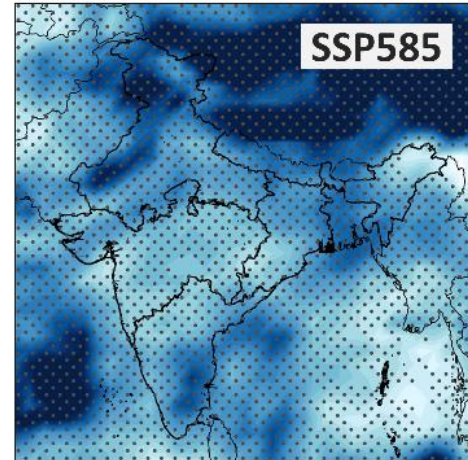
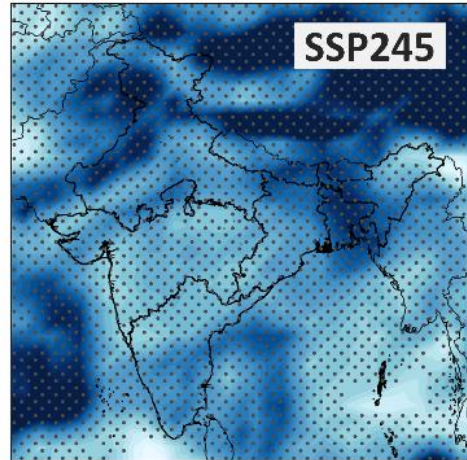


Resource availability

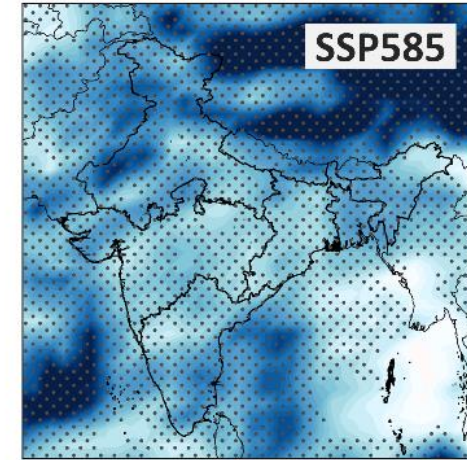
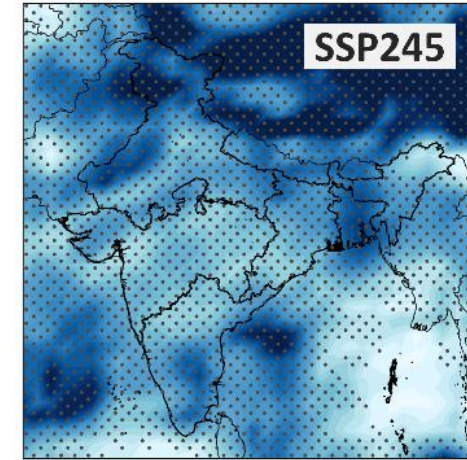
Hist. Consecutive Days



GWL: 1.5°C



GWL: 2°C

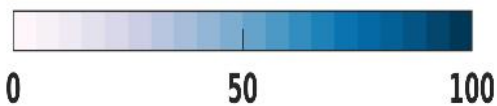
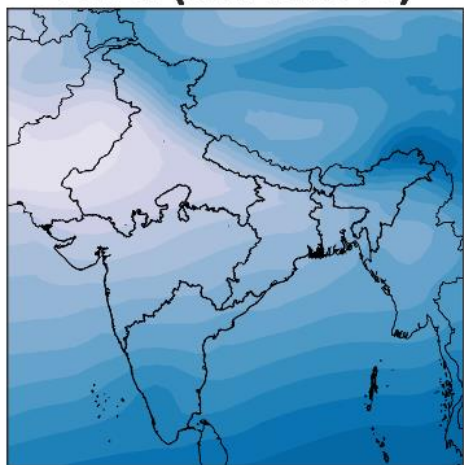


Days/Year

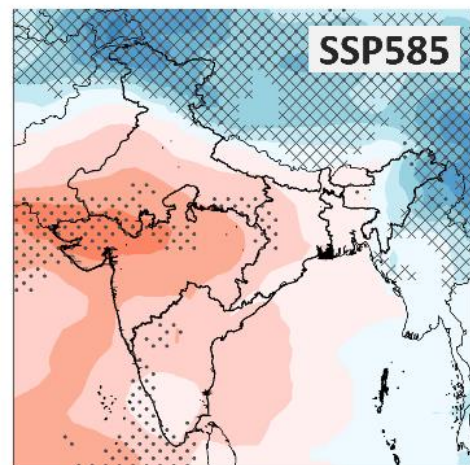
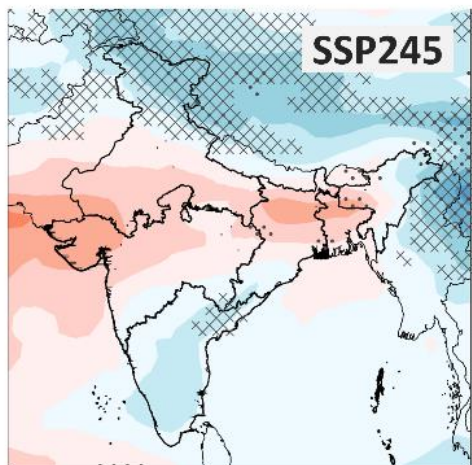
Consecutive Days

Change in Cloud fraction & AOD

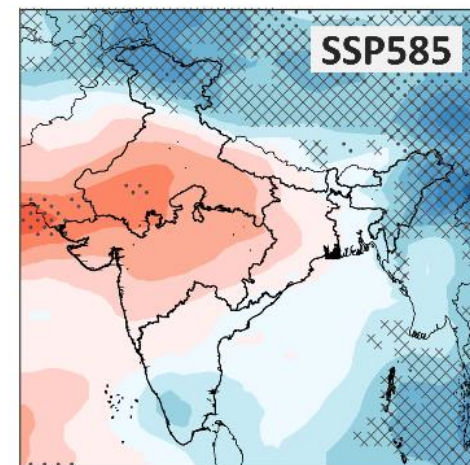
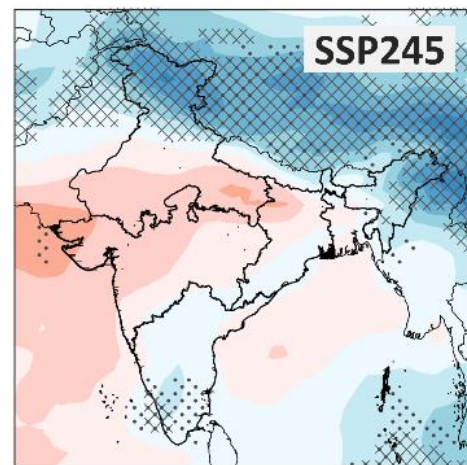
Hist. (cld frac %)



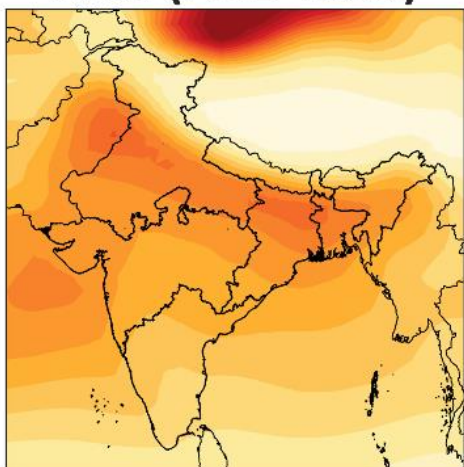
GWL: 1.5°C



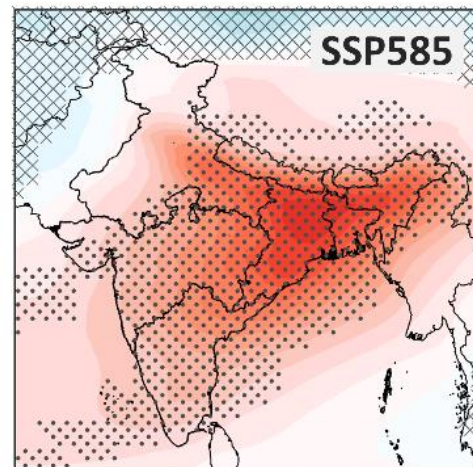
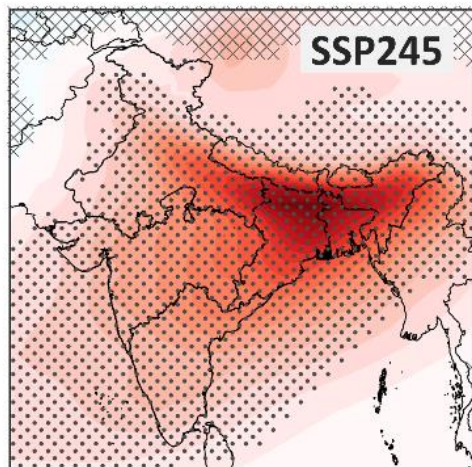
GWL: 2°C



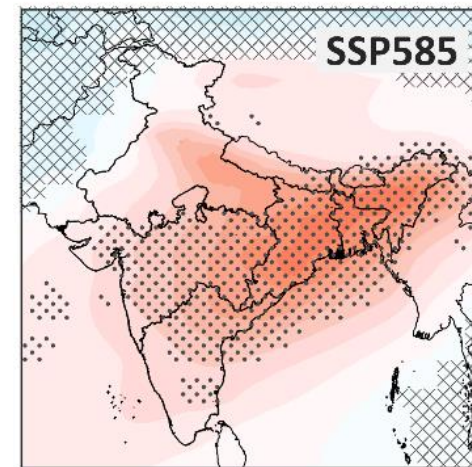
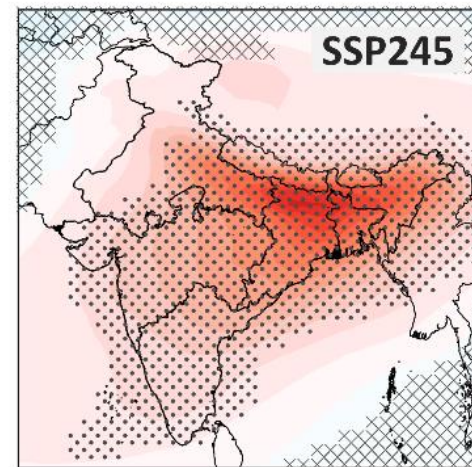
Hist. (AOD :unit)



GWL: 1.5°C

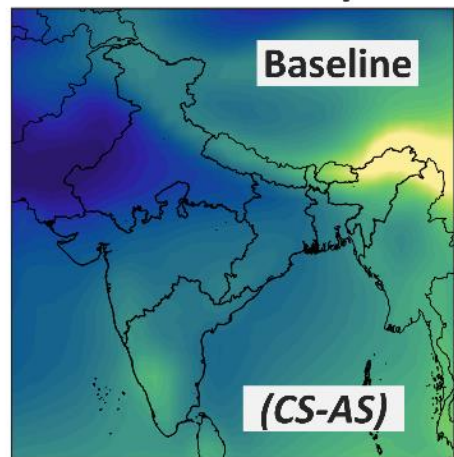


GWL: 2°C

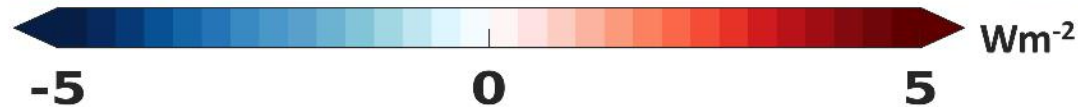
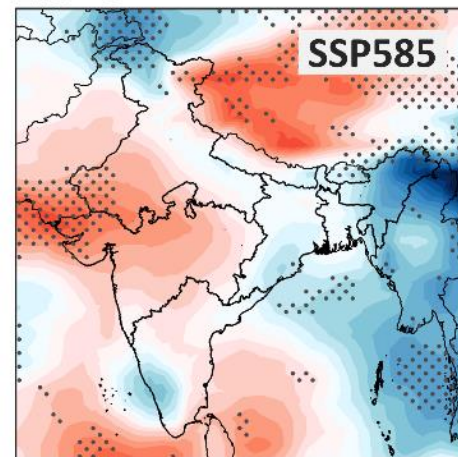
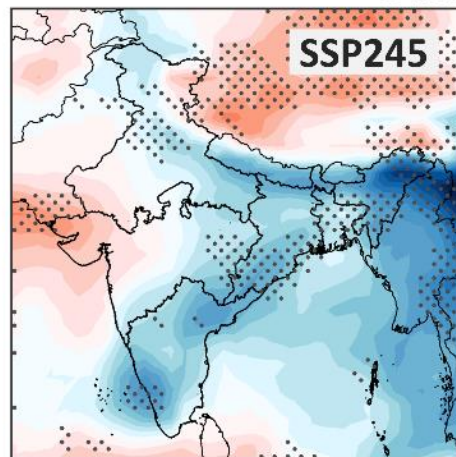


Change in Cloud-impact & Clearness Index

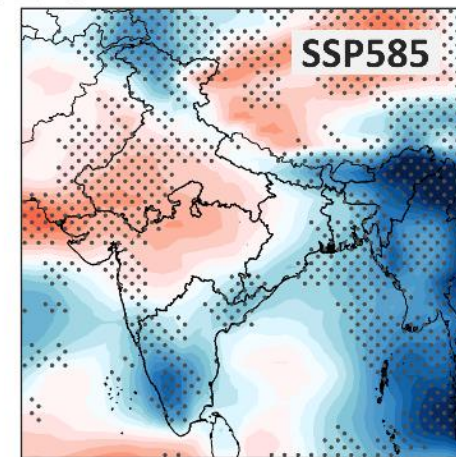
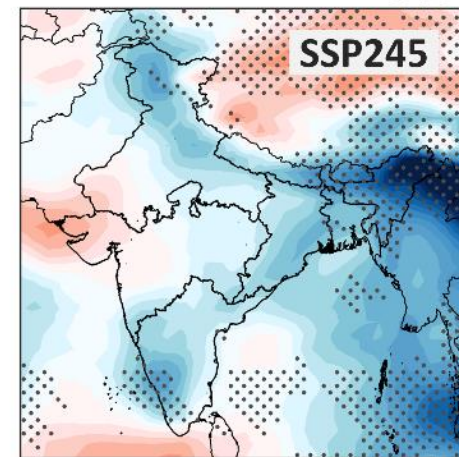
Hist. Cloud-impact



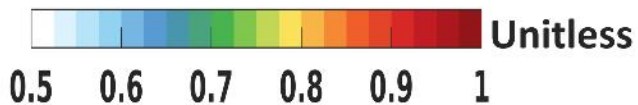
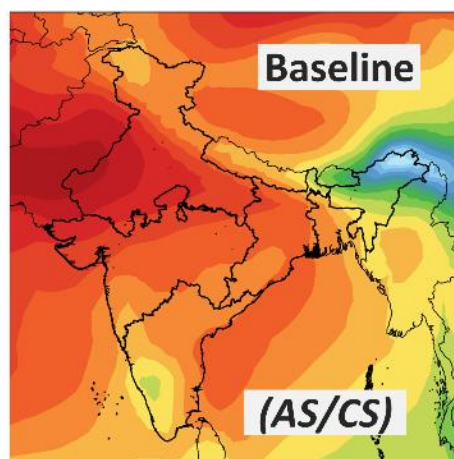
GWL: 1.5°C



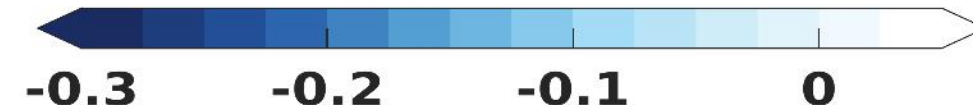
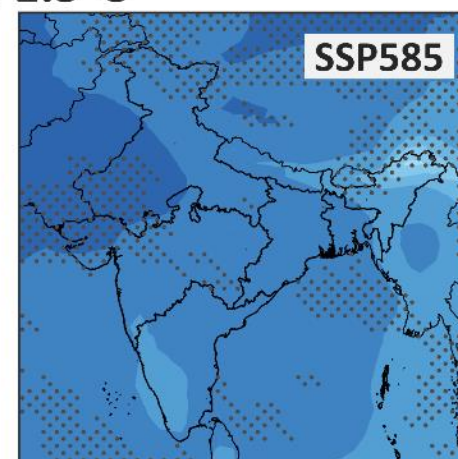
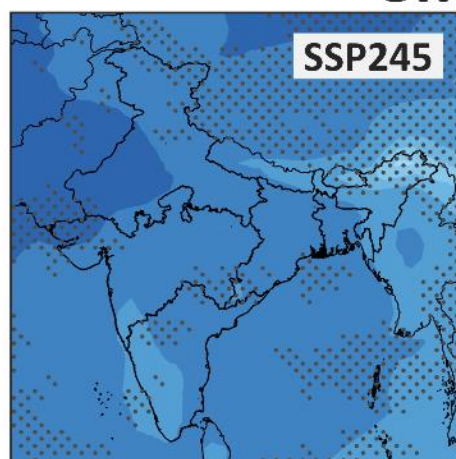
GWL: 2°C



Hist. Clearness Index



GWL: 1.5°C



GWL: 2°C

