

Summer NAO Influence on south Asian Monsoon

Group Members

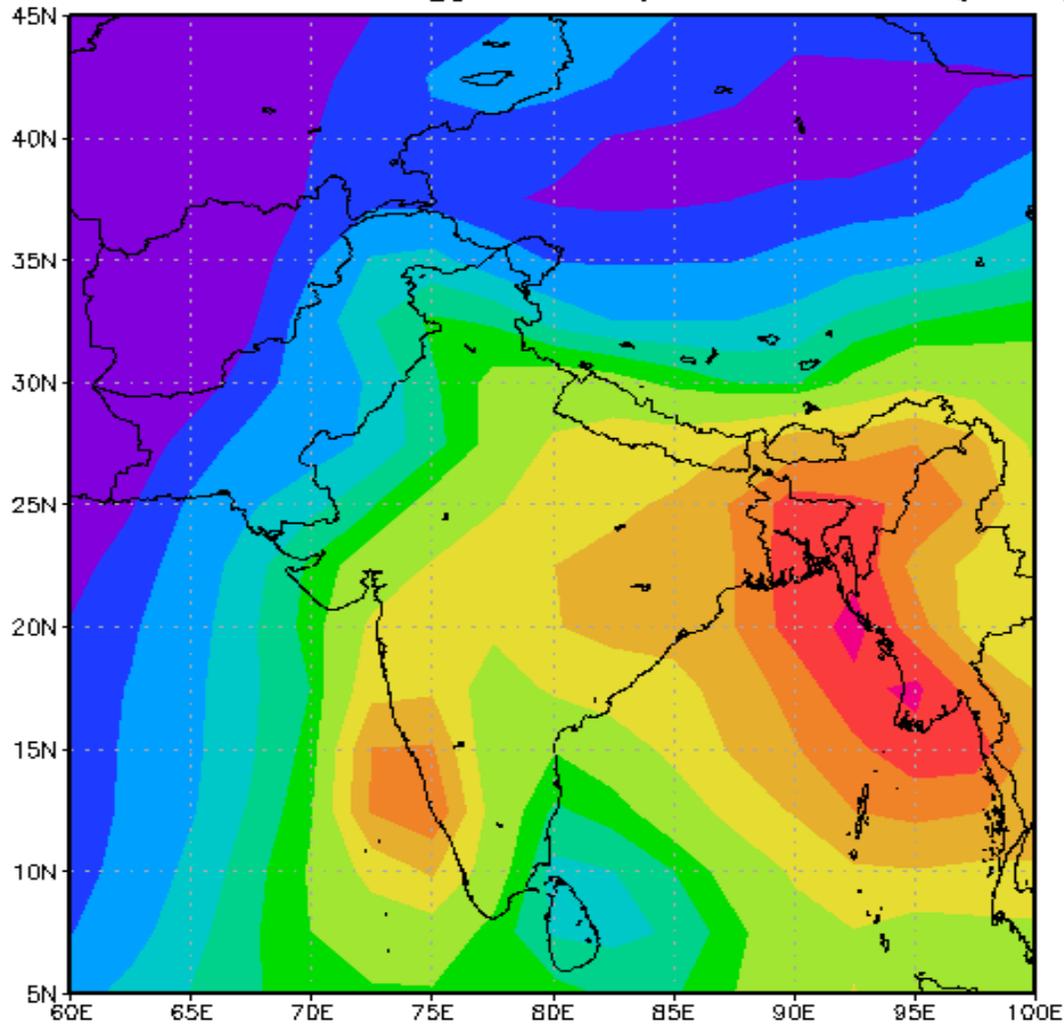
Shahbaz Mehmood, Muhammad Adnan, Muhammad Latif,
Imran Siddiqi, Zaman

TTA – 2014, ICTP

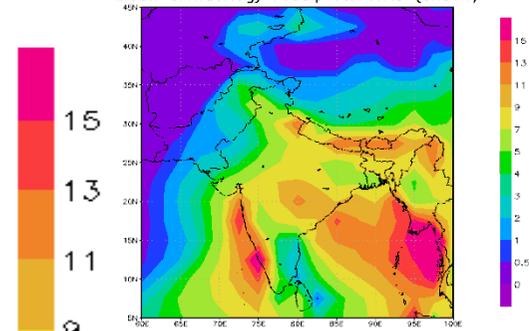
Outline

- Observed and simulated mean climatology over south Asia
- NAOI composites (Obs. & Model)
- Regression patterns(Obs. & Model)
- Predictability Skill

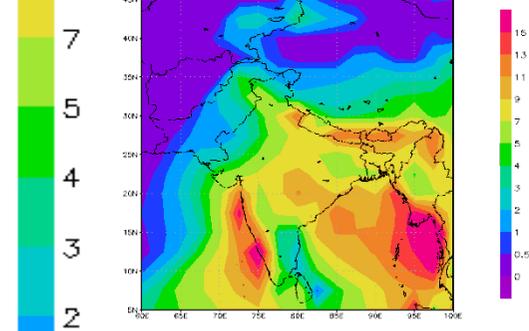
Mean Climatology Precip for JJAS (obs)



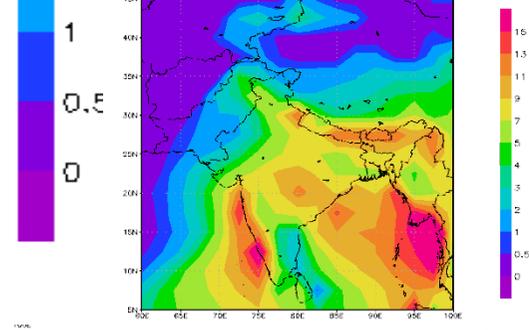
Mean Climatology Precip for JJAS (ens04)



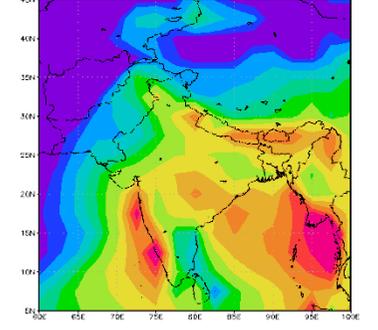
Mean Climatology Precip for JJAS (ens08)



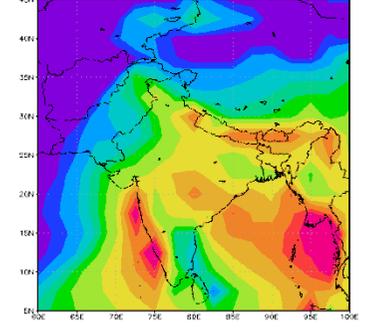
Mean Climatology Precip for JJAS (ens12)



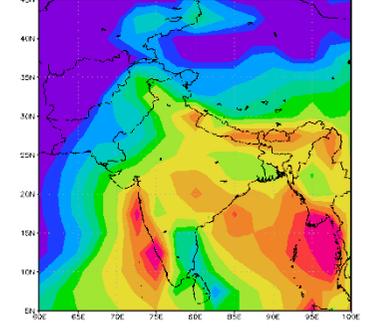
Mean Climatology Precip for JJAS (ens13)



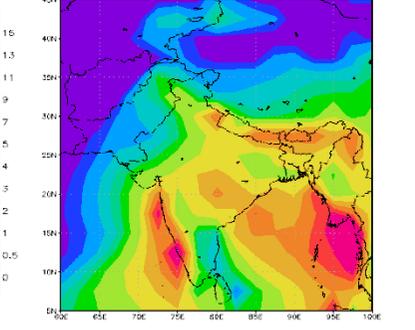
Mean Climatology Precip for JJAS (ens14)



Mean Climatology Precip for JJAS (ens15)

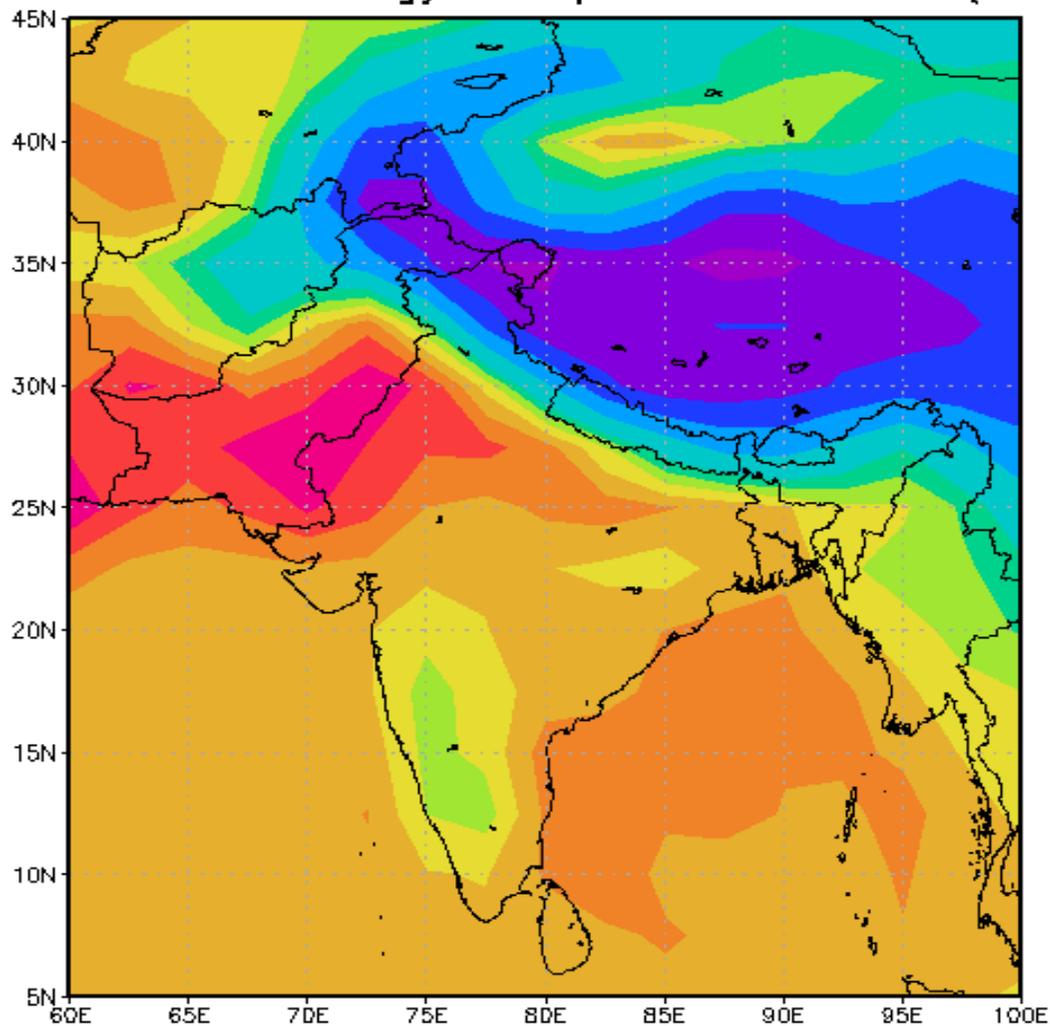


Mean Climatology Precip for JJAS (ensmean)

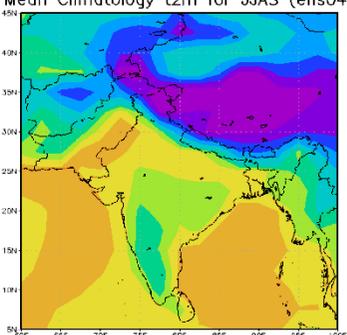


Observed and simulated mean climatology - Precipitation

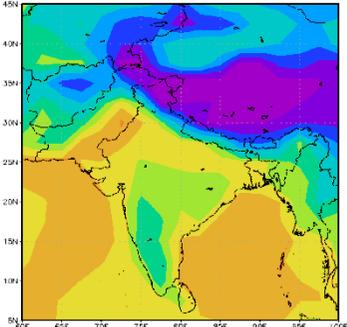
Mean Climatology temp2m for JJAS (obs)



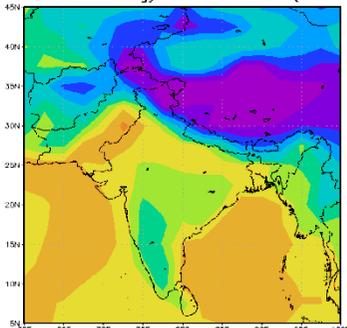
Mean Climatology t2m for JJAS (ens04)



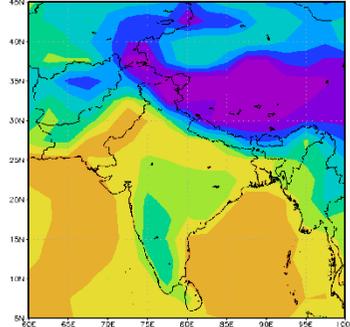
Mean Climatology t2m for JJAS (ens08)



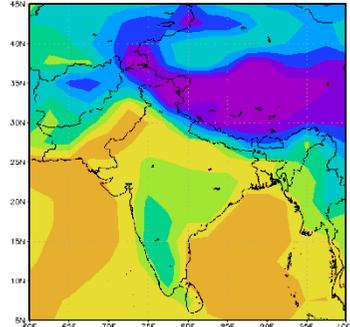
Mean Climatology t2m for JJAS (ens12)



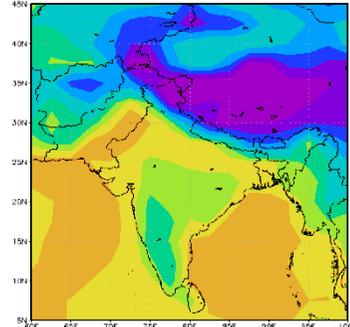
Mean Climatology t2m for JJAS (ens13)



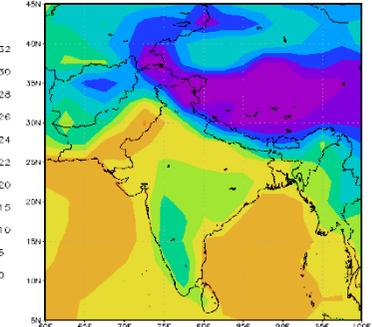
Mean Climatology t2m for JJAS (ens14)



Mean Climatology t2m for JJAS (ens15)



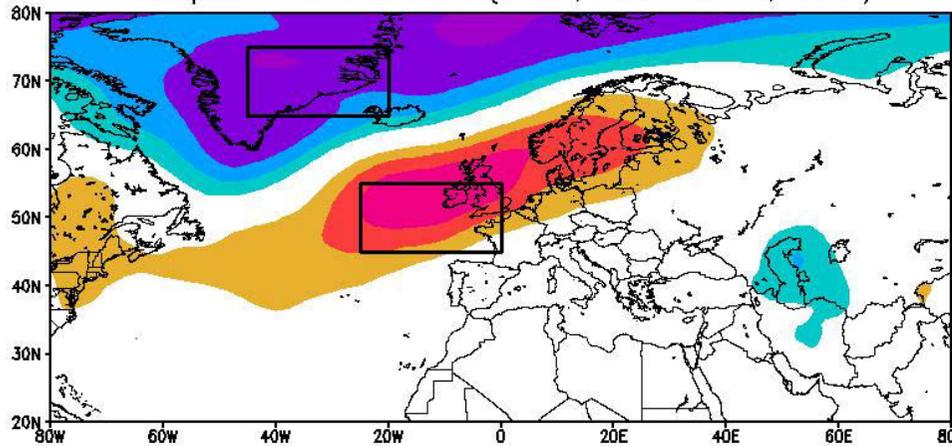
Mean Climatology t2m for JJAS (ensmean)



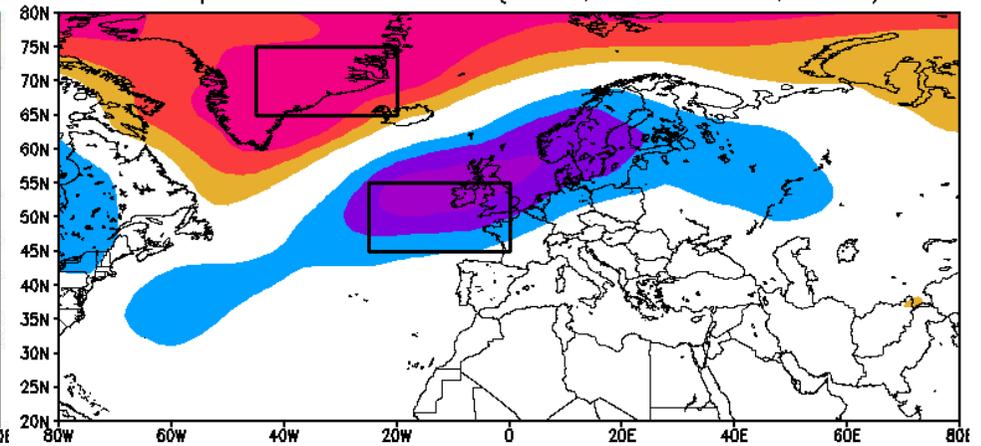
Observed and simulated mean climatology - Temperature

NAOI Composites Obs.

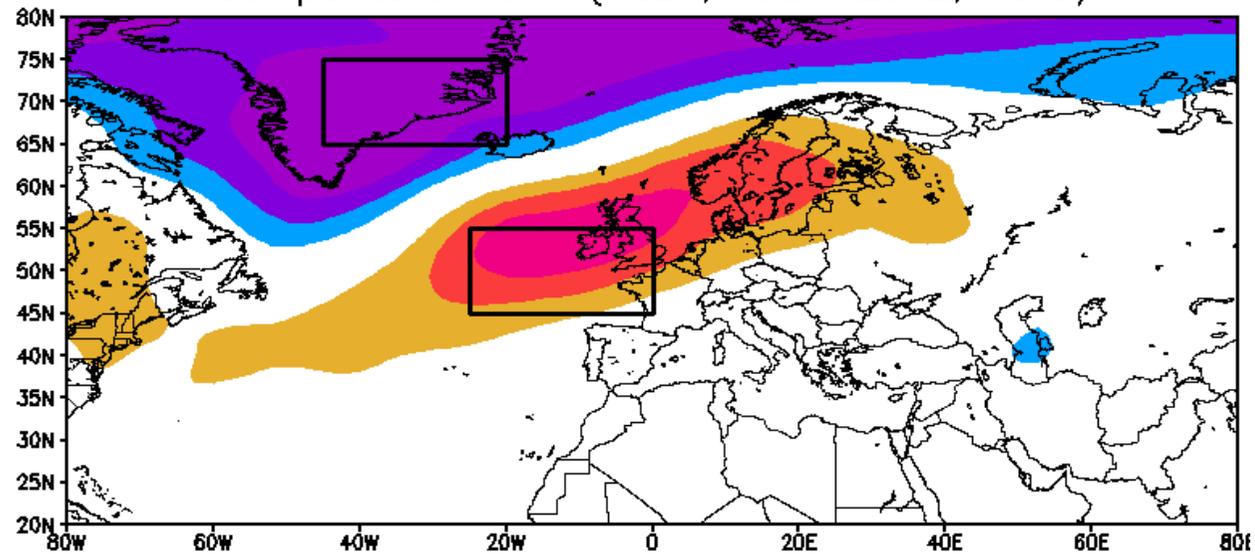
Composite of +Ve NAOI (NCEP; 1981–2012; 1STD)



Composite of -Ve NAOI (NCEP; 1981–2012; 1STD)

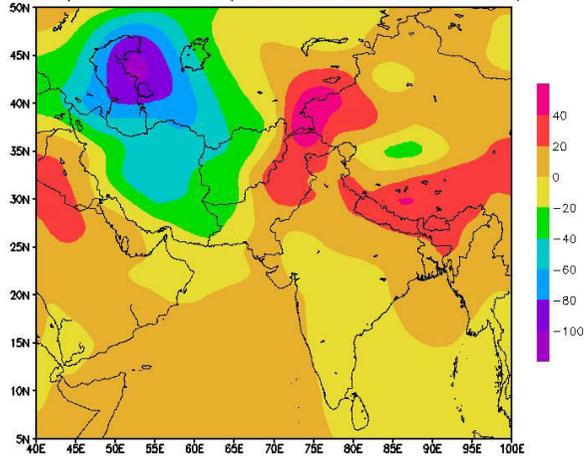


Composite of NAOI (NCEP; 1981–2012; 1STD)

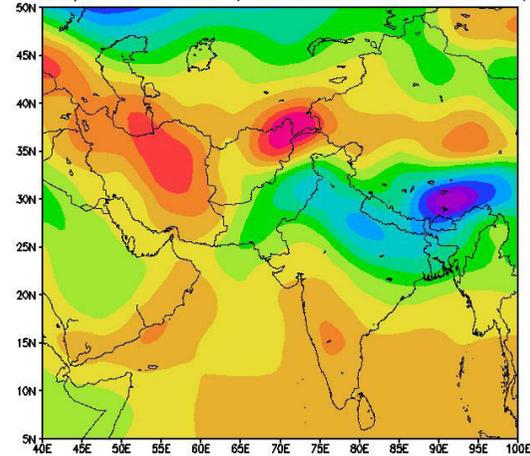


NAOI Composites for MSLP (Obs. & Sim.)

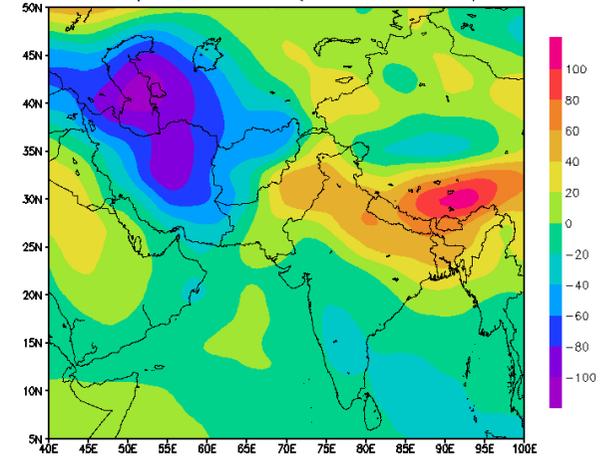
Composite of MSLP (+ve NAOI; Obs; 1981–2012;)



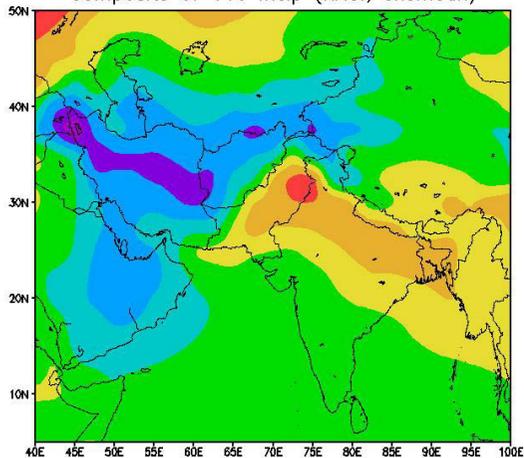
Composite of MSLP (-ve NAOI; Obs; 1981–2012;)



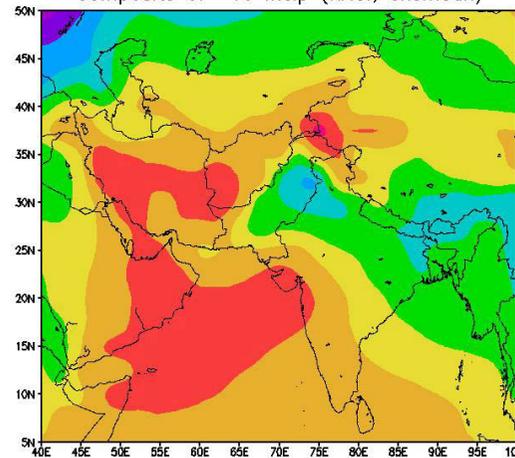
Composite of MSLP (Obs; 1981–2012)



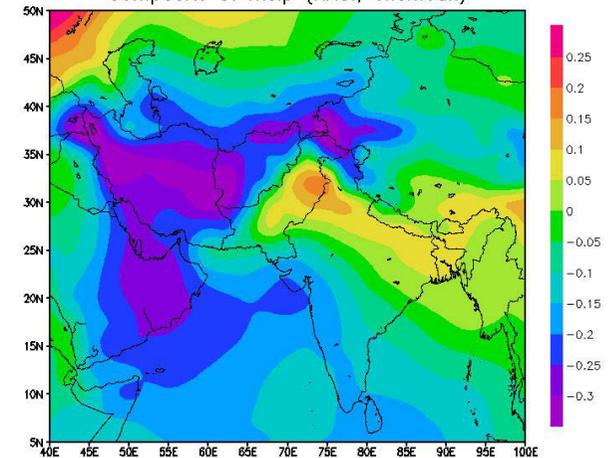
Composite of +ve mslp (NAOI; ensmean)



Composite of -ve mslp (NAOI; ensmean)

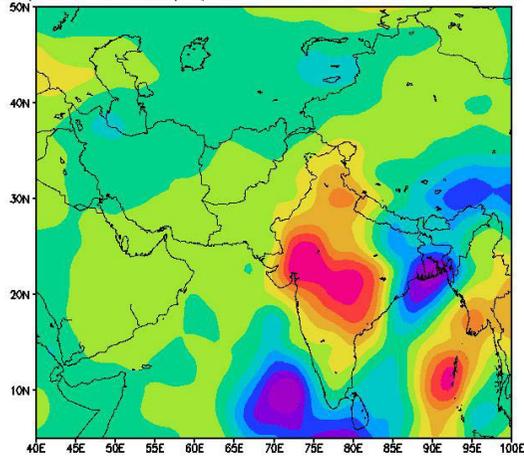


Composite of mslp (NAOI; ensmean)

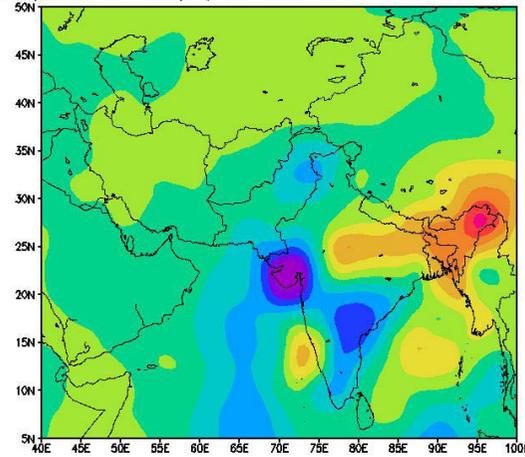


NAOI Composites for Precip. (Obs. & Sim.)

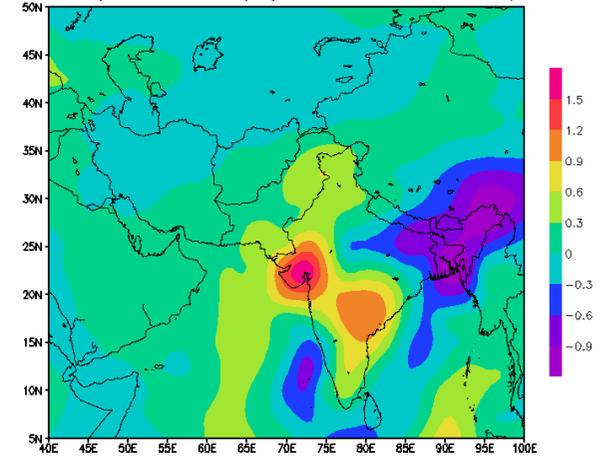
Composite of Precip (+Ve NAOI; GPCP-Obs; 1981-2012;)



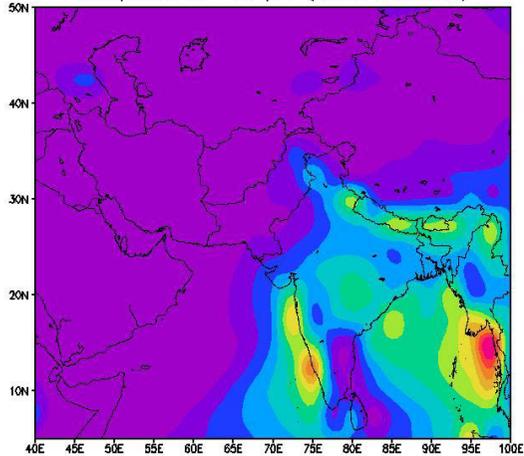
Composite of Precip (-Ve NAOI; GPCP-Obs; 1981-2012;)



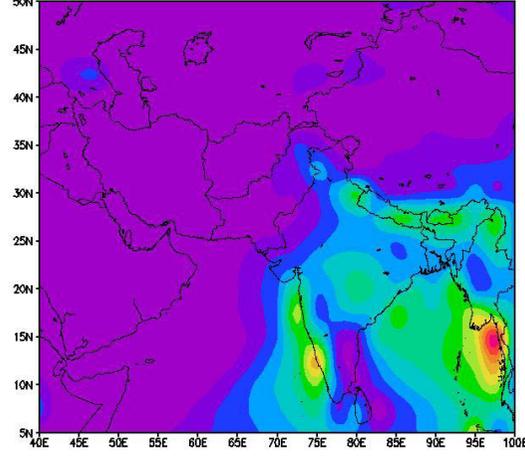
Composite of Precip (GPCP-Obs; 1981-2012)



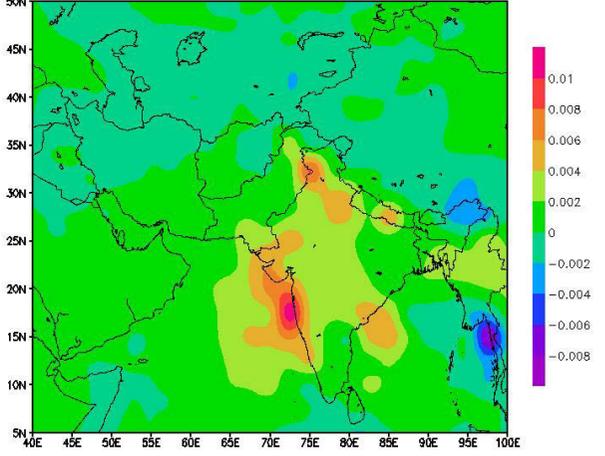
Composite of +ve pre (NAOI; ensmean)



Composite of -ve pre (NAOI; ensmean)

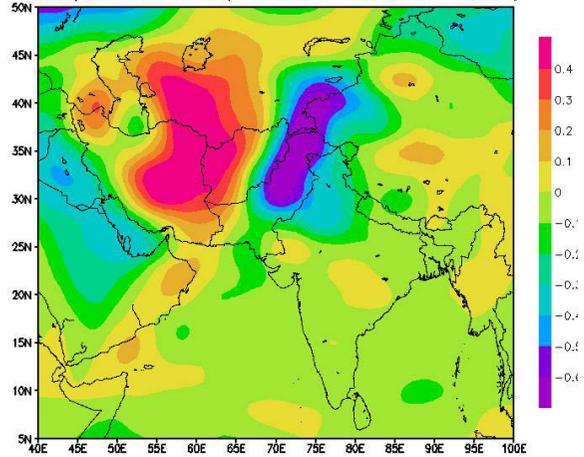


Composite of pre (NAOI; ensmean)

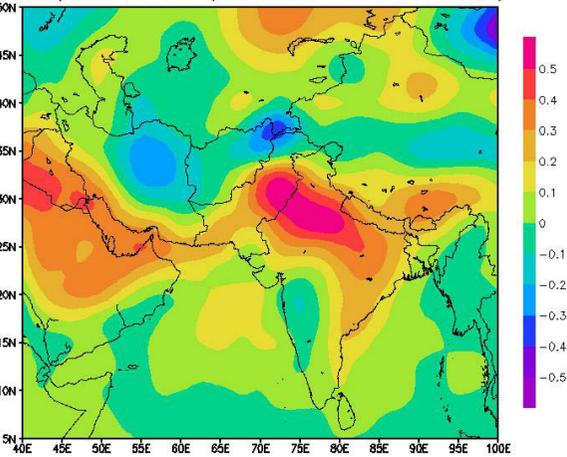


NAOI Composites for Temp. (Obs. & Sim.)

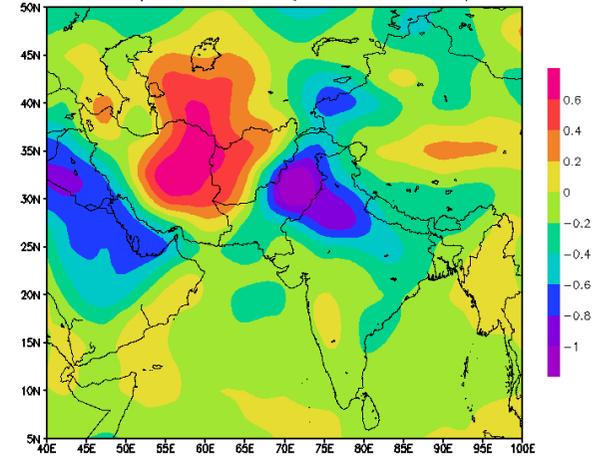
Composite of T2m (+Ve NAOI; Obs; 1981–2012;)



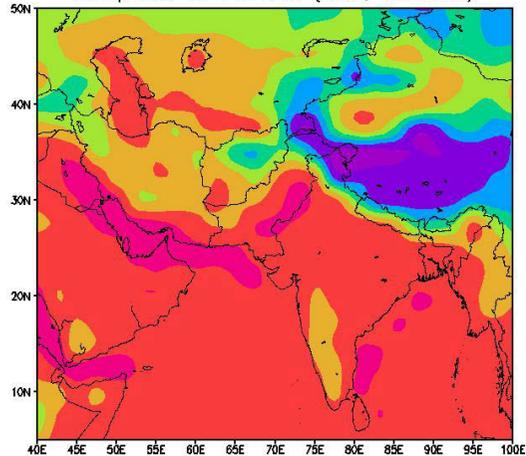
Composite of T2m (-Ve NAOI; Obs; 1981–2012;)



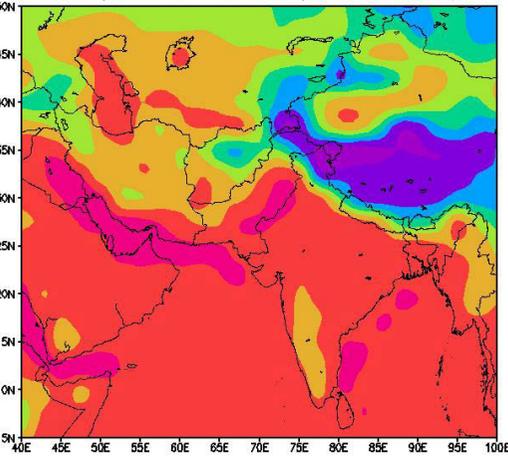
Composite of T2m (Obs; 1981–2012)



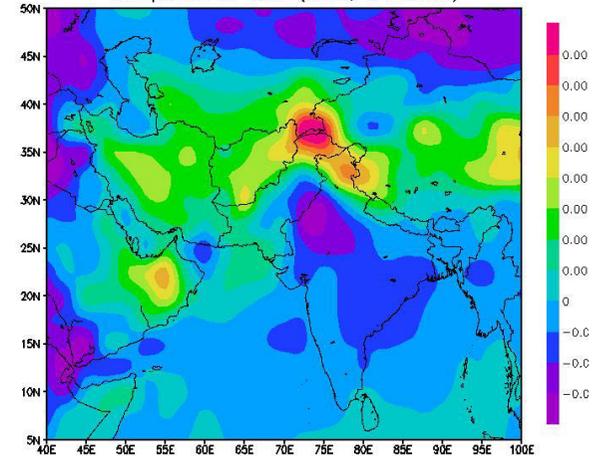
Composite of +ve t2m (NAOI; ensmean)



Composite of -ve t2m (NAOI; ensmean)

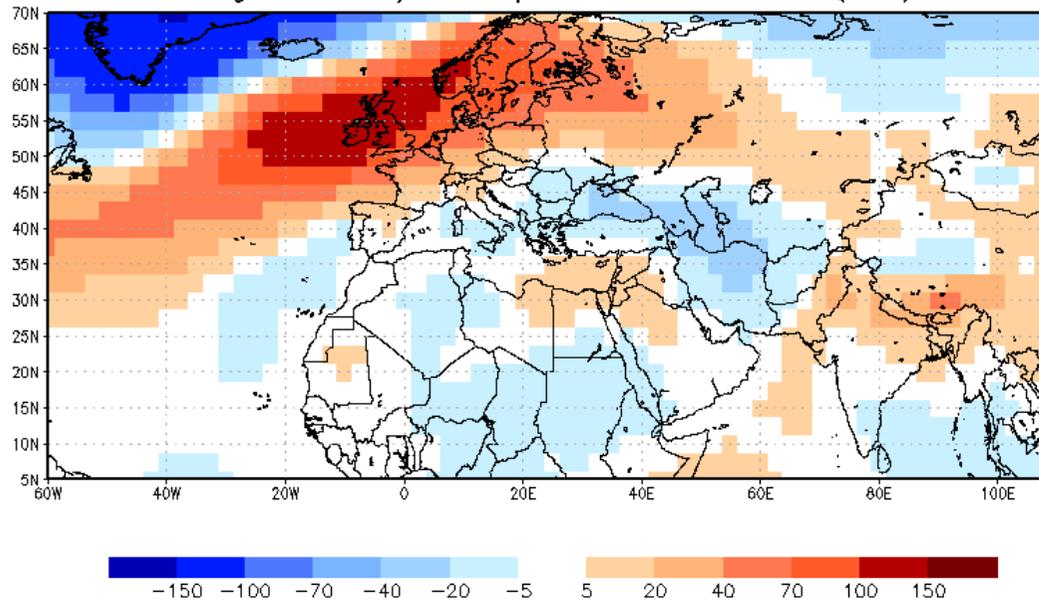


Composite of t2m (NAOI; ensmean)

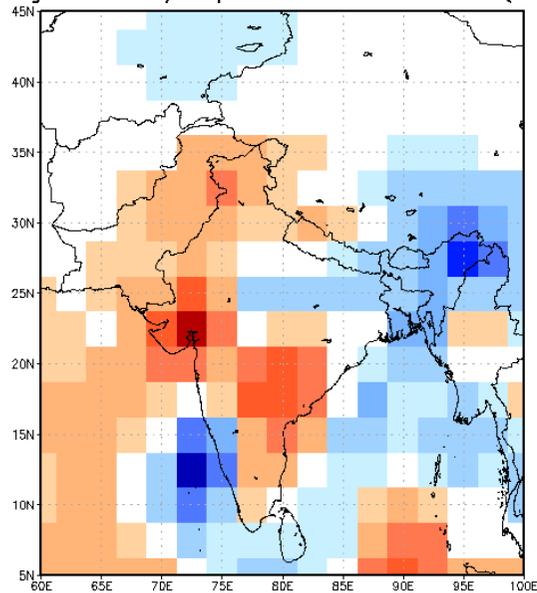


Regression Patterns – Obs.

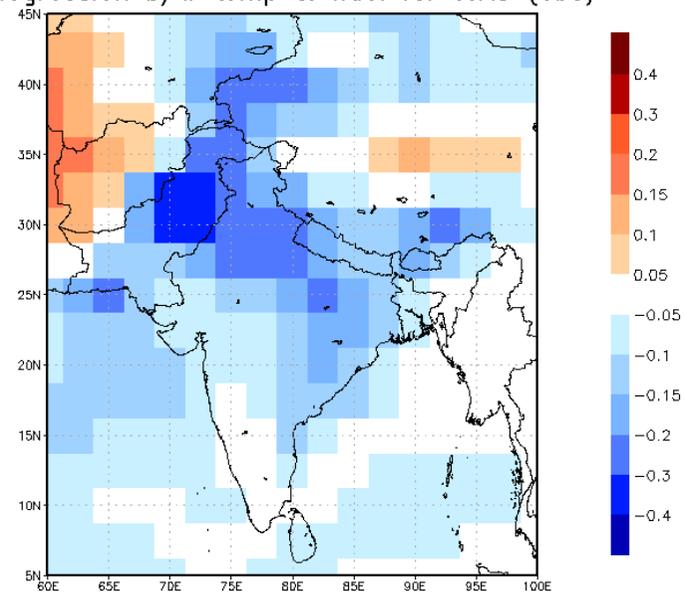
Regression b/w mslp & naoi for JJAS (obs)



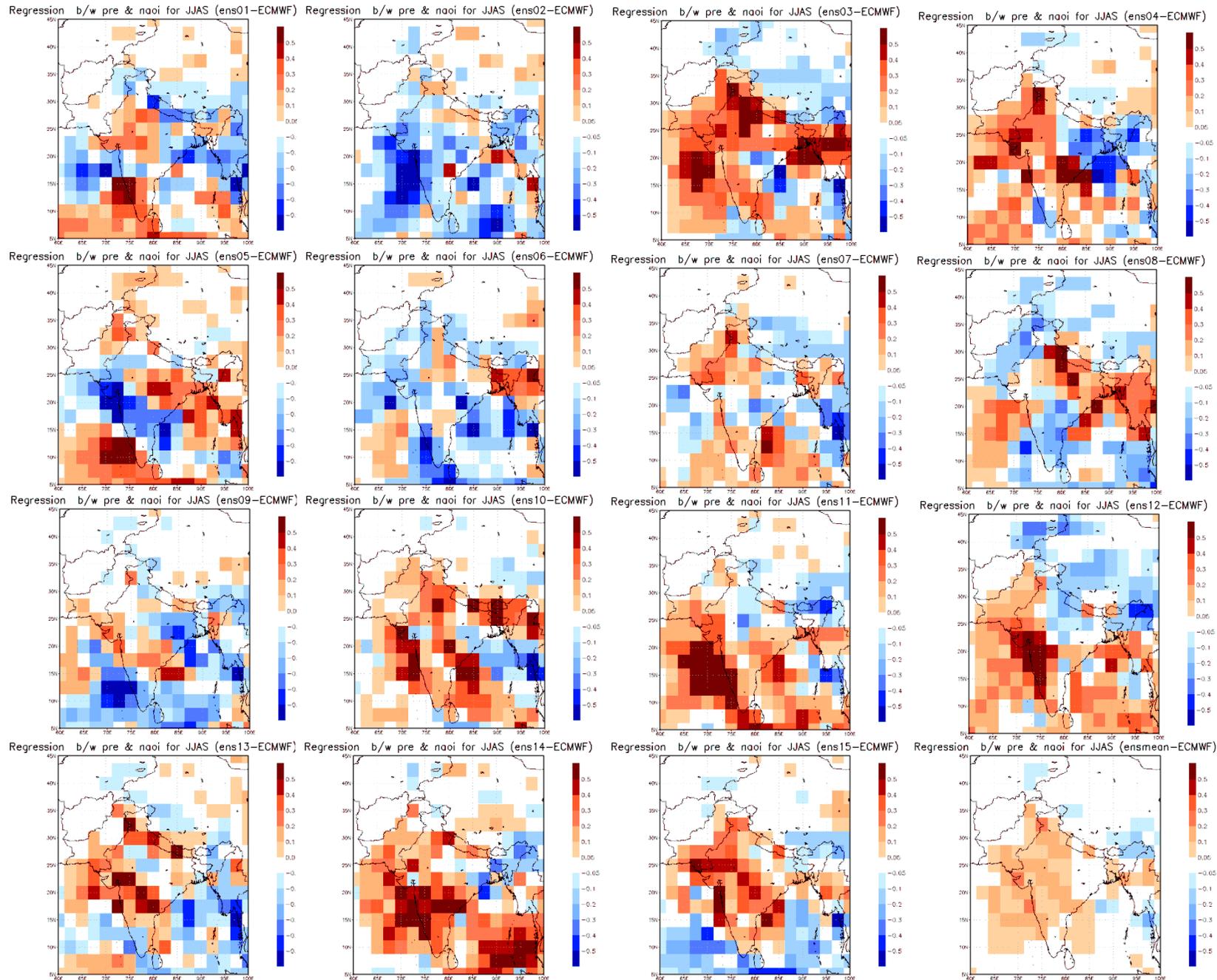
Regression b/w pre & naoi for JJAS (obs)

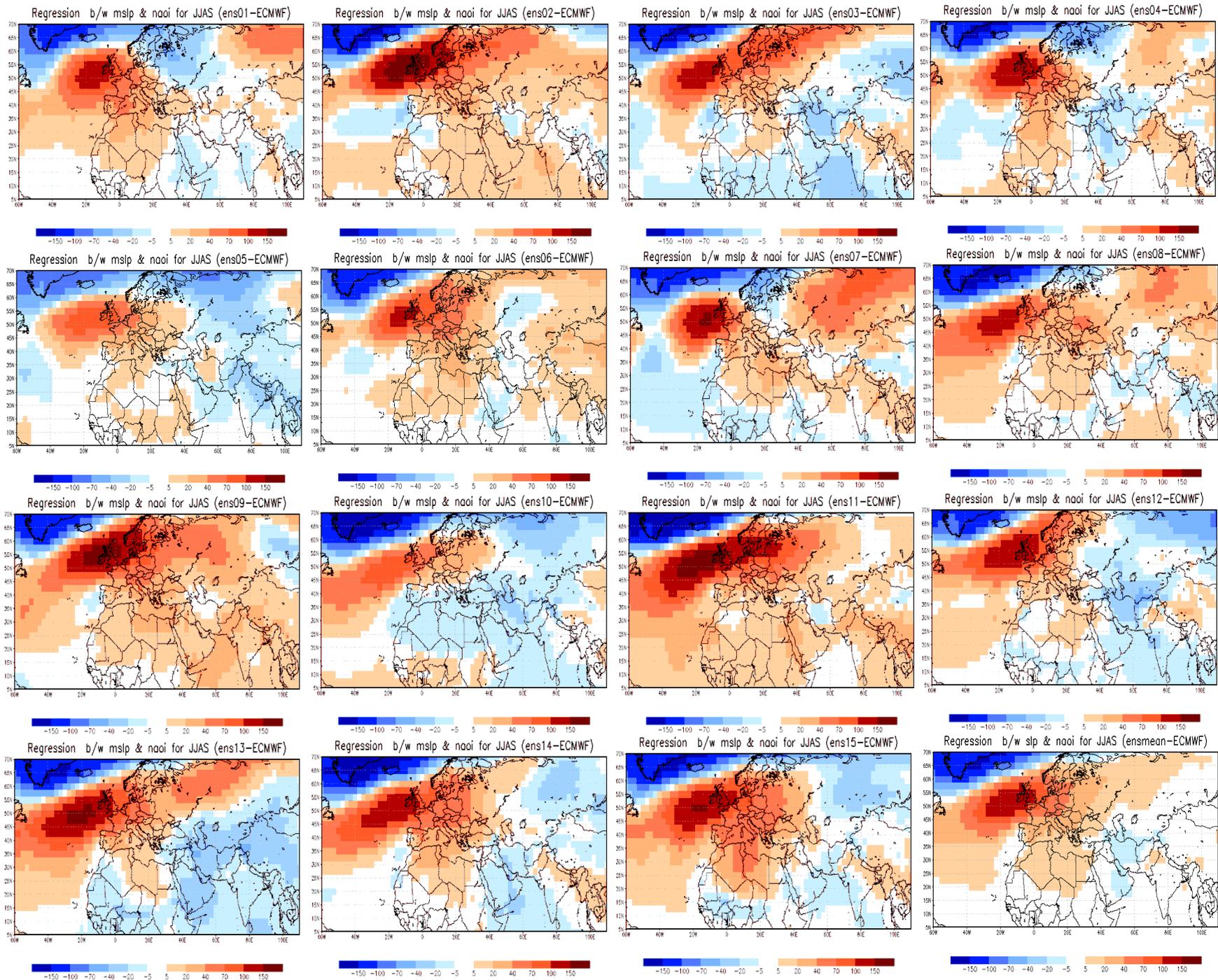


Regression b/w temp & naoi for JJAS (obs)

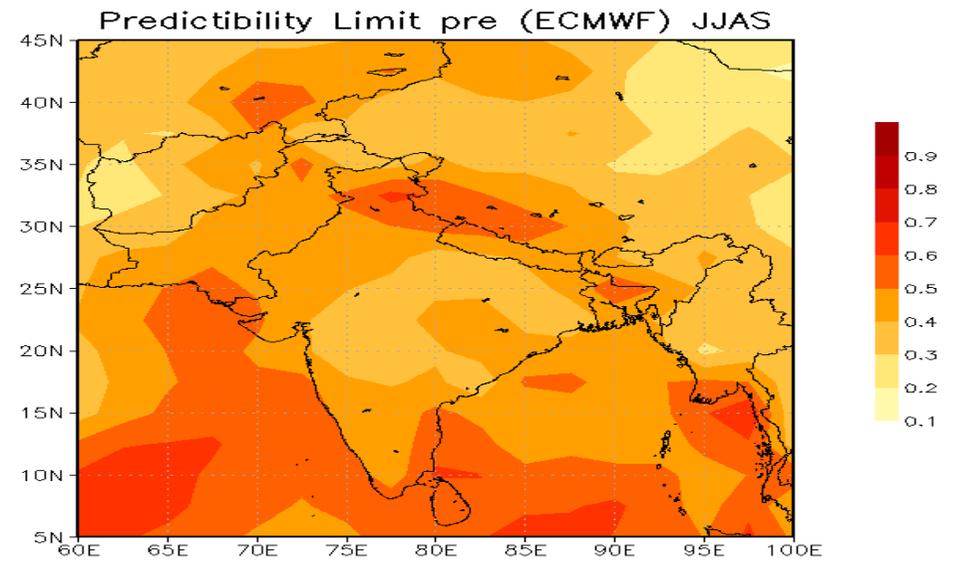
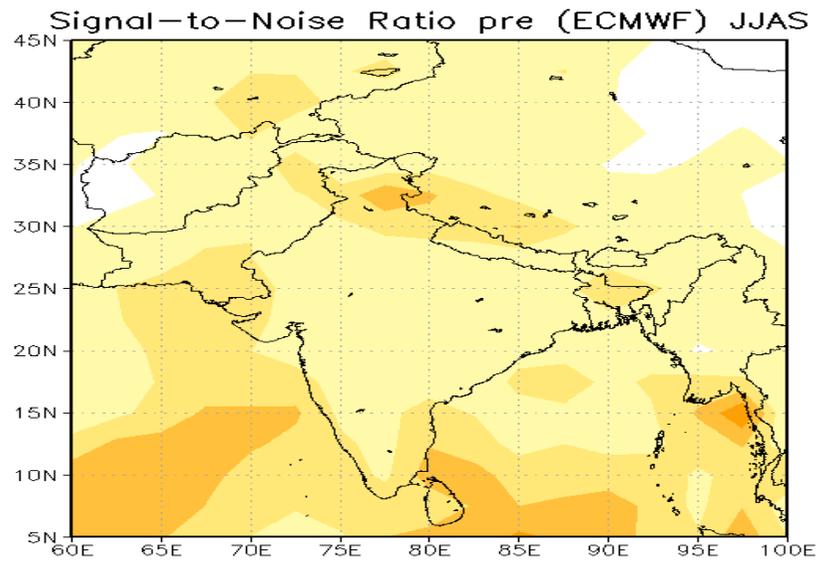
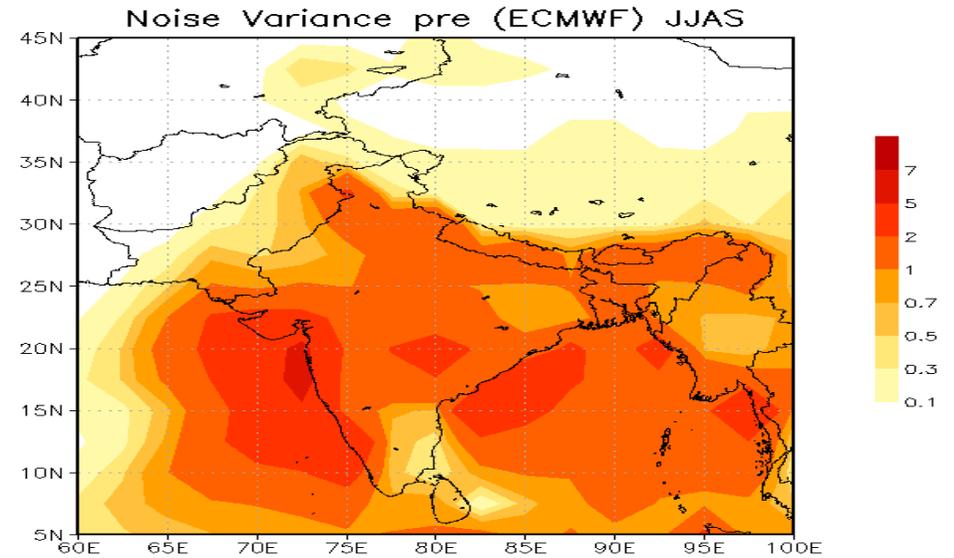
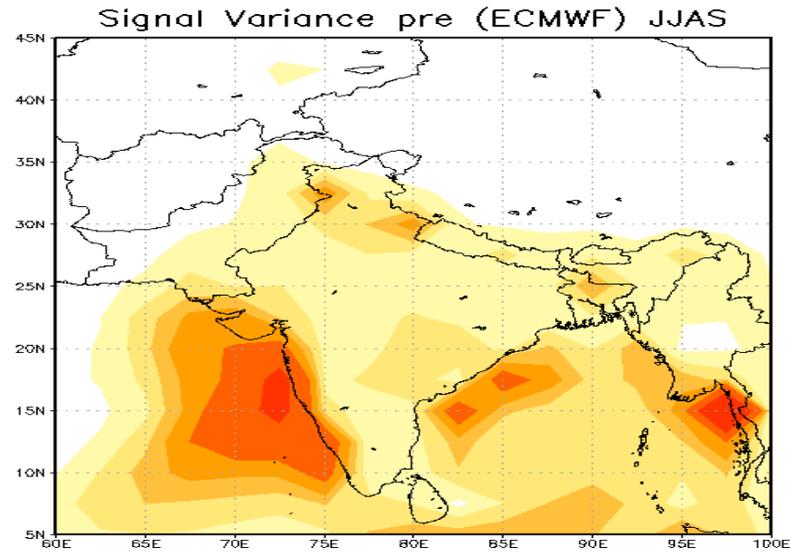


Regression Patterns – Obs.



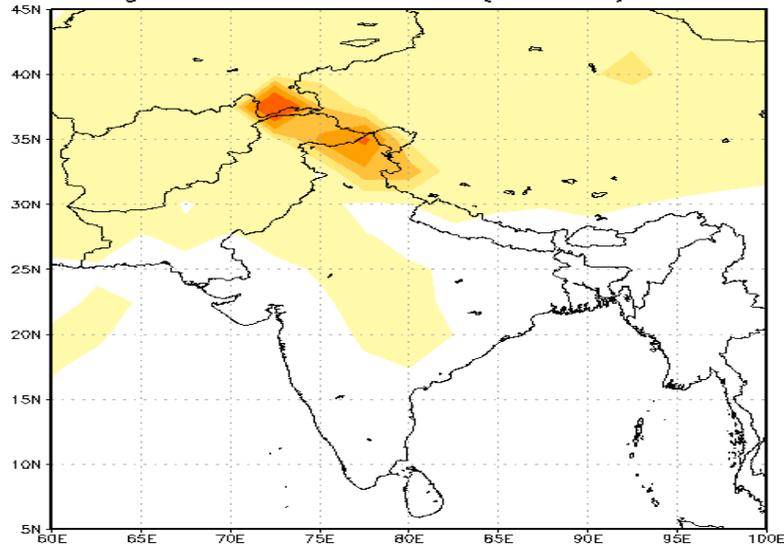


Predictability Skill of the Model for Precipitation

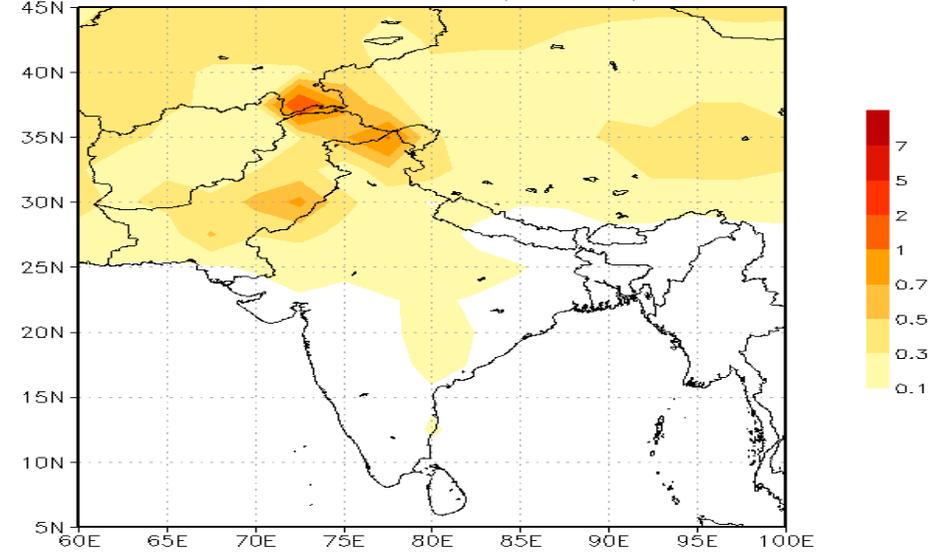


Predictability Skill of the Model for Temperature

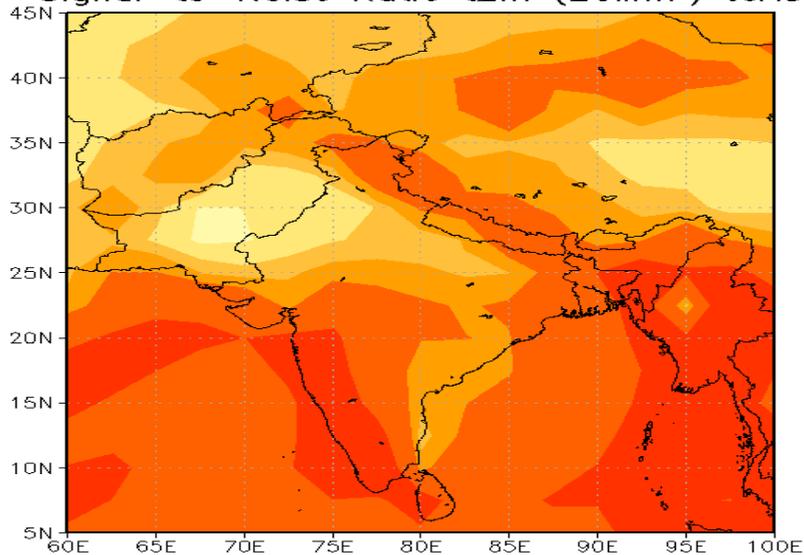
Signal Variance t2m (ECMWF) JJAS



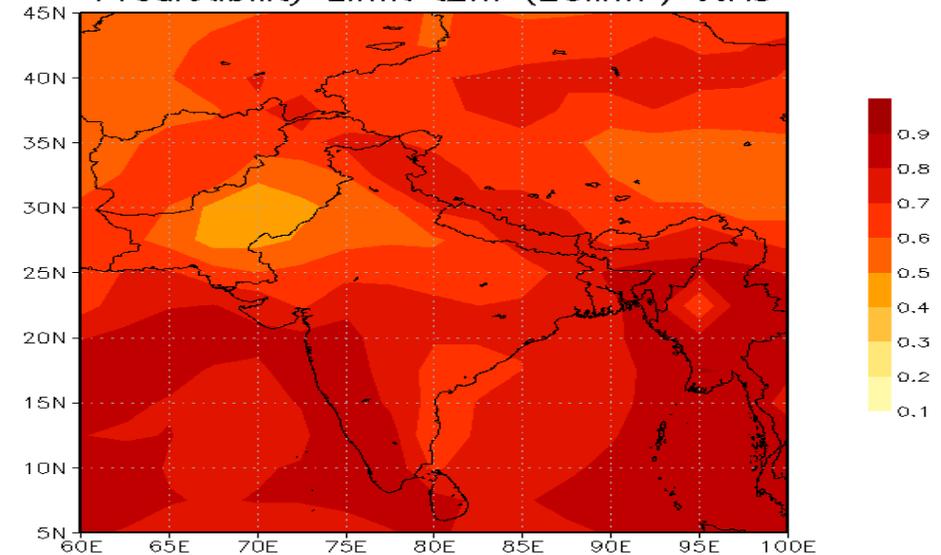
Noise Variance t2m (ECMWF) JJAS



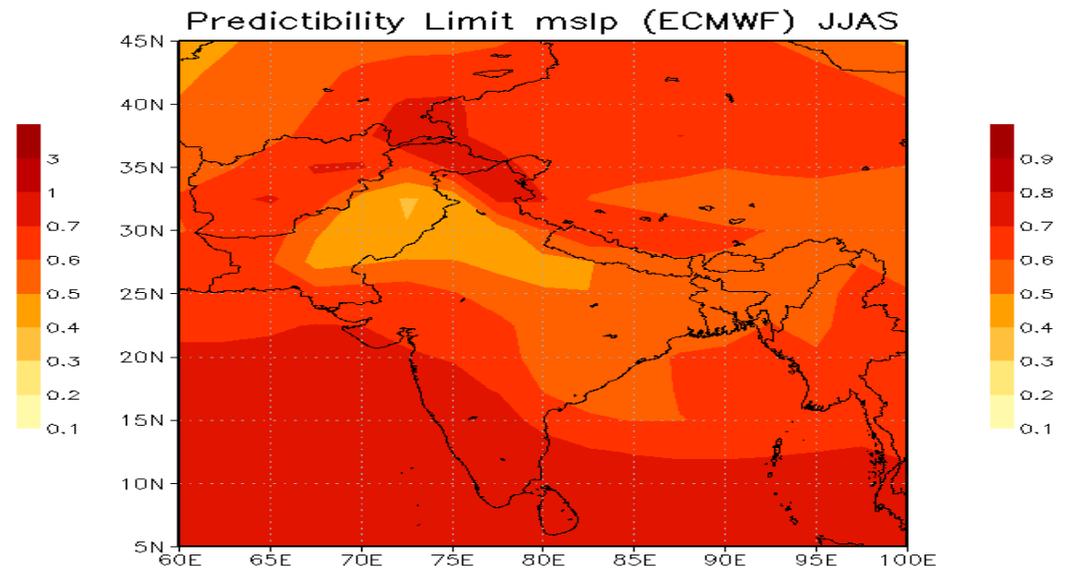
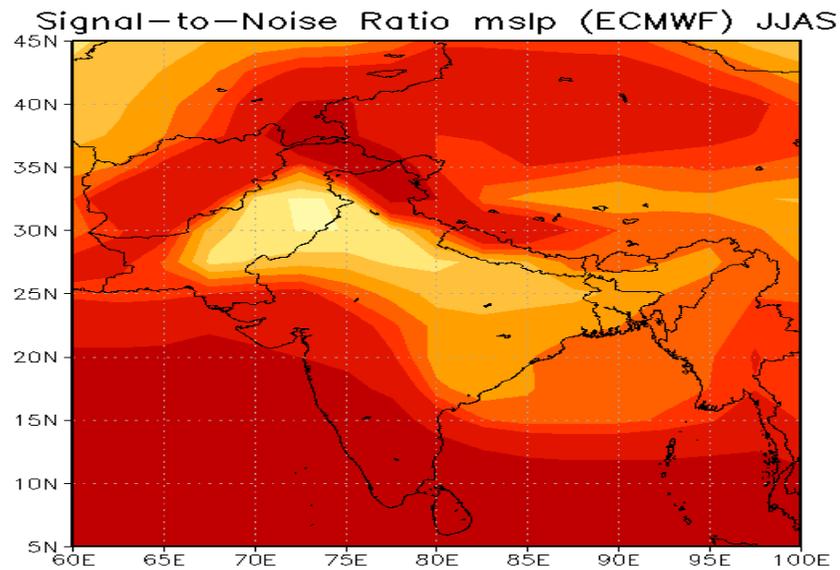
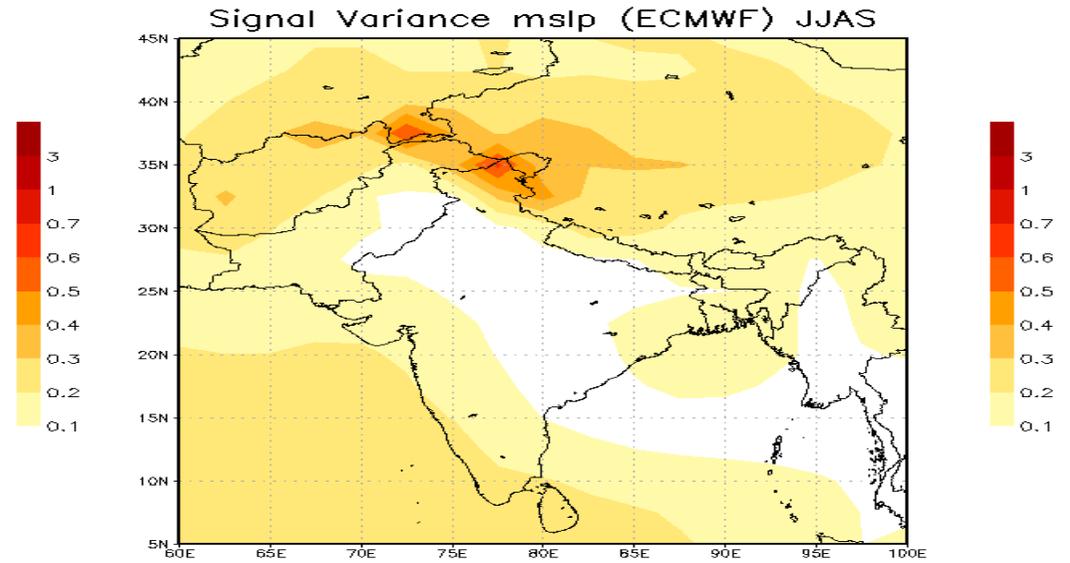
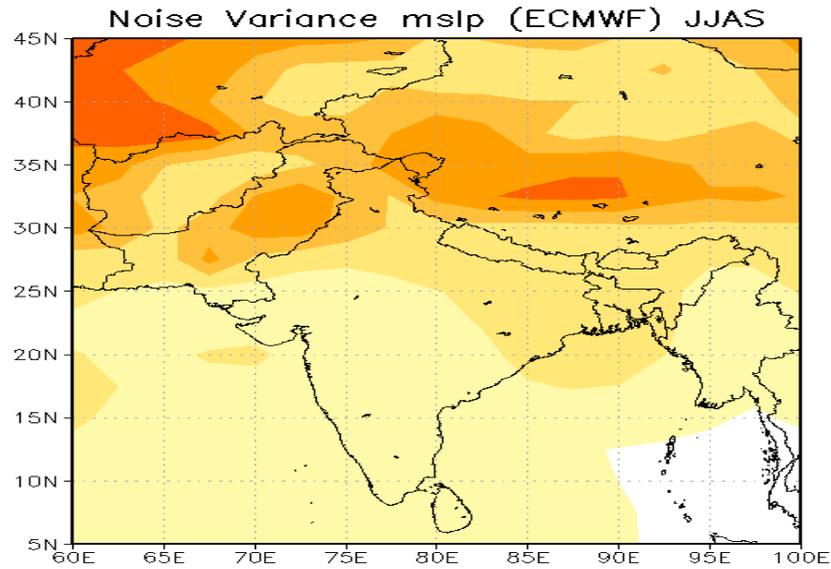
Signal-to-Noise Ratio t2m (ECMWF) JJAS



Predictability Limit t2m (ECMWF) JJAS

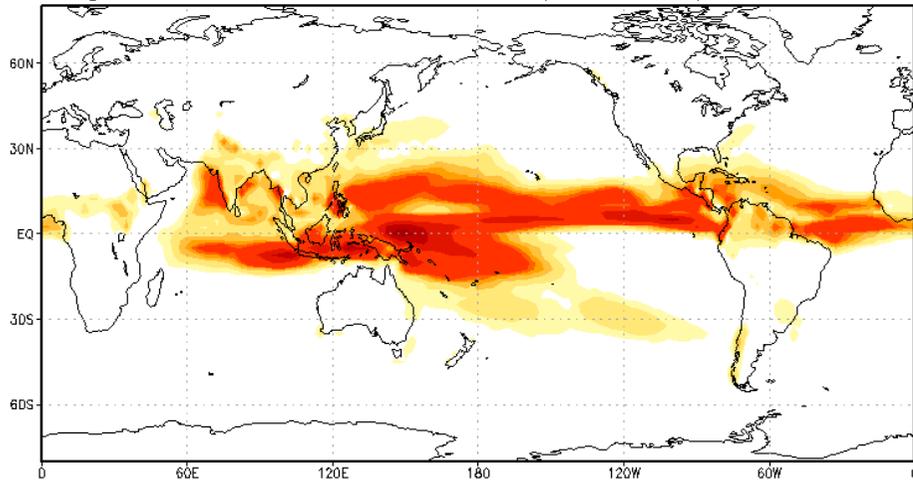


Predictability Skill of the Model for MSLP

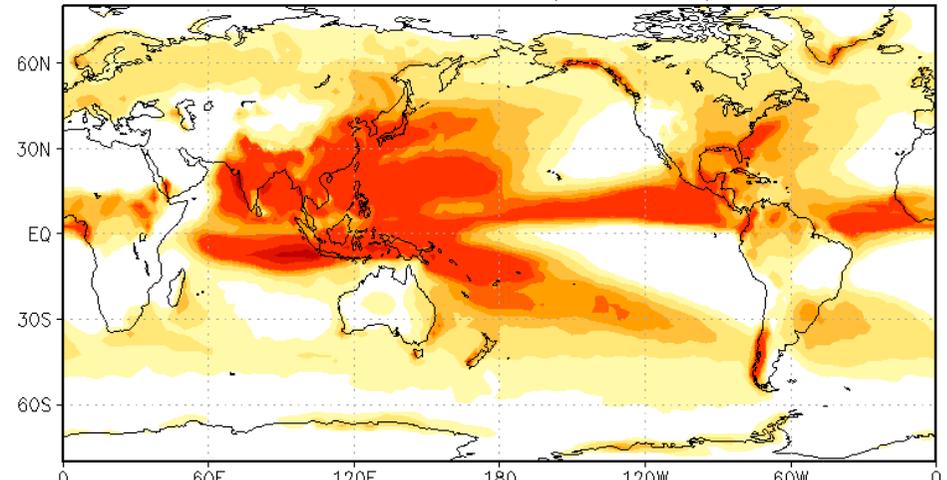


THANKS

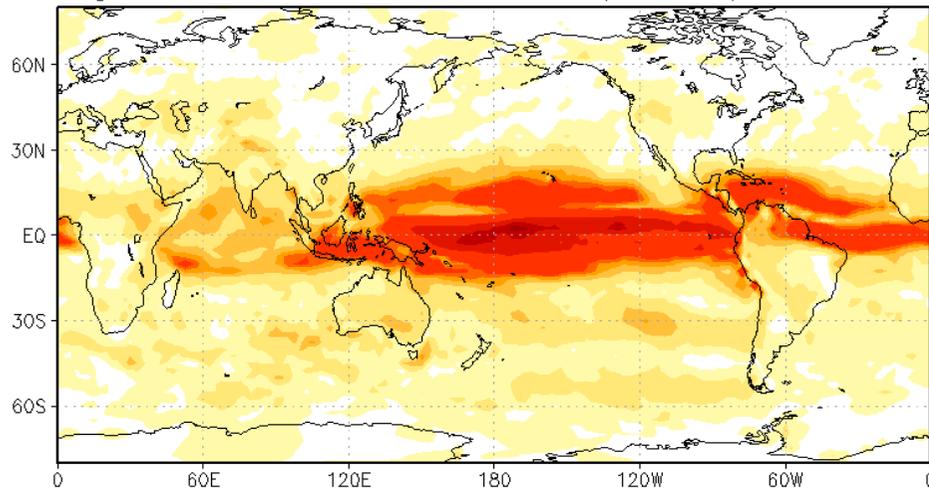
Signal Variance PRCP (ECMWF) JJAS



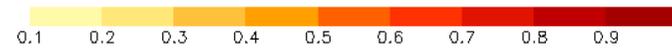
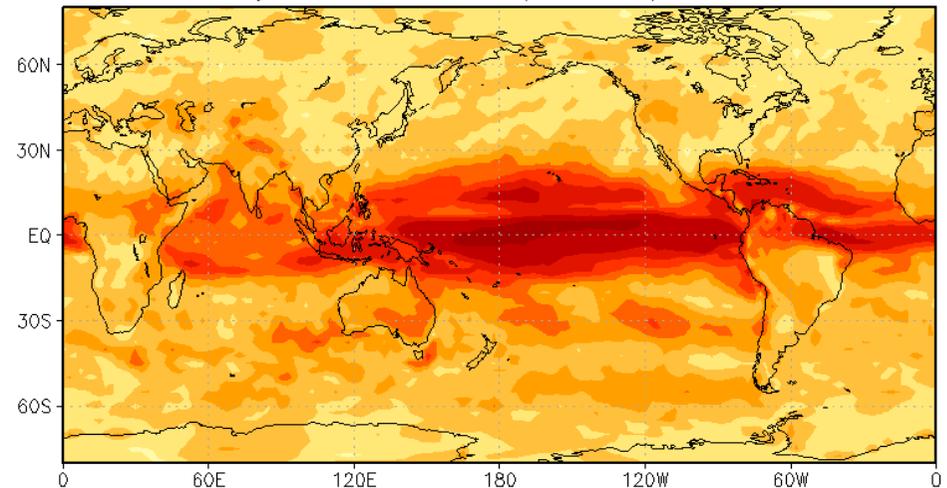
Noise Variance PRCP (ECMWF) JJAS



Signal-to-Noise Ratio PRCP (ECMWF) JJAS

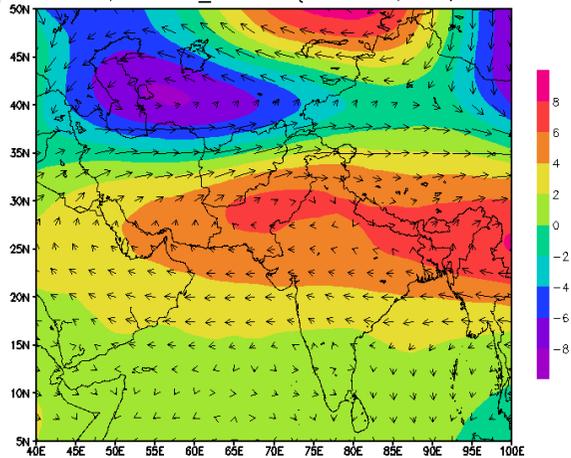


Predictability Limit PRCP (ECMWF) JJAS

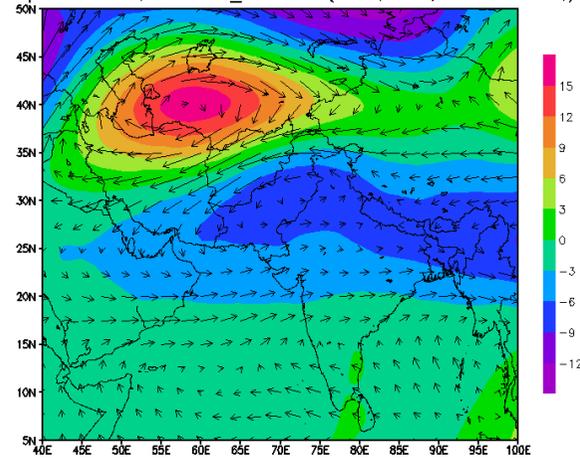


NAOI Composites Obs.

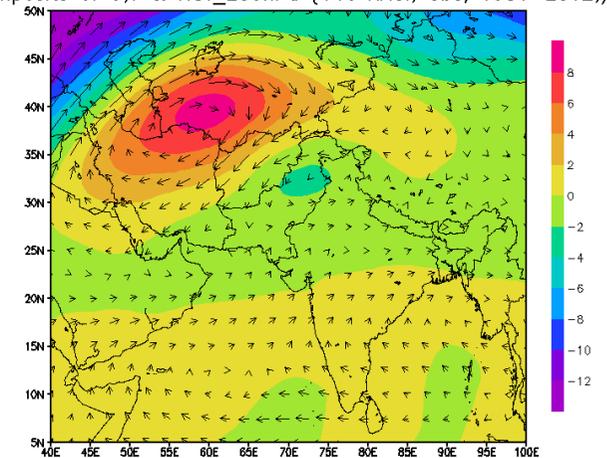
Composite of U;V & HGT_200hPa (-Ve NAOI; Obs; 1981-2012;)



Composite of U;V & HGT_200hPa (NAOI; Obs; 1981-2012;)

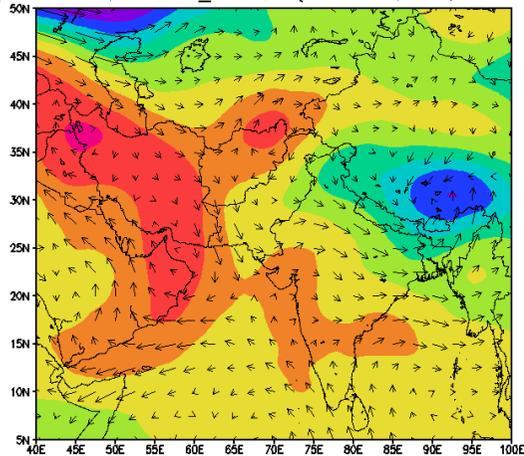


Composite of U;V & HGT_200hPa (+Ve NAOI; Obs; 1981-2012;)

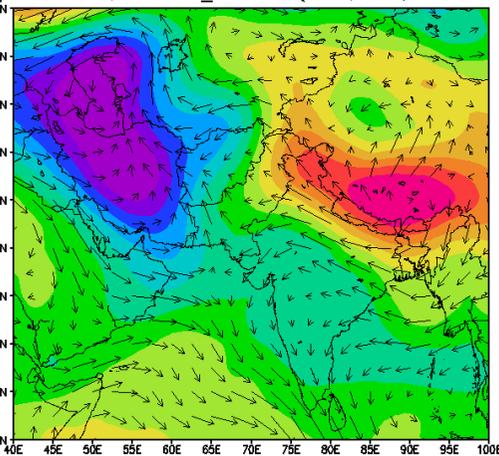


NAOI Composites Obs.

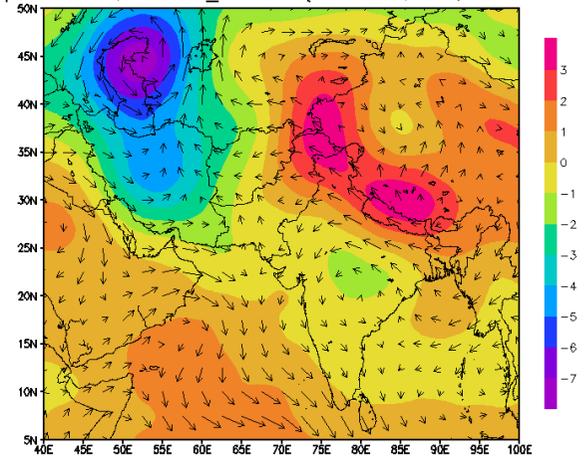
Composite of U;V & HGT_850hPa (-Ve NAOI; Obs; 1981-2012;)

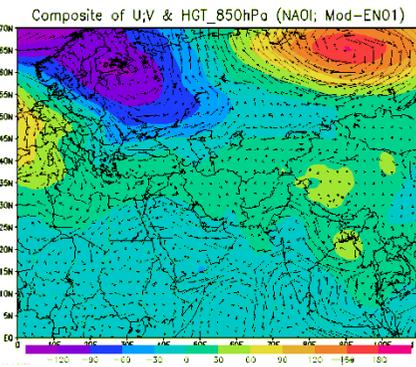
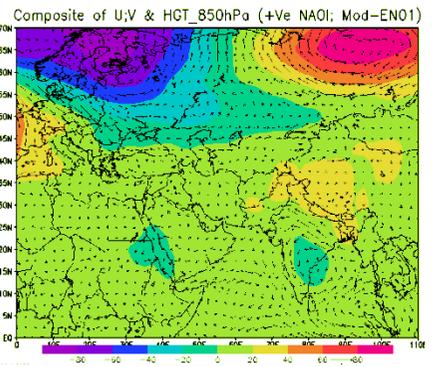
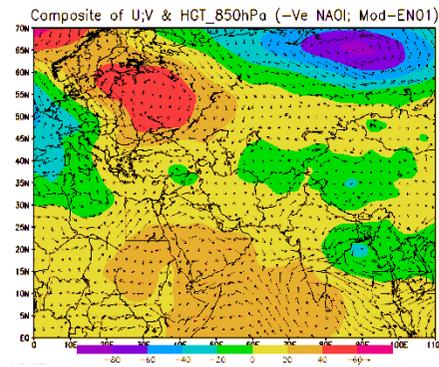
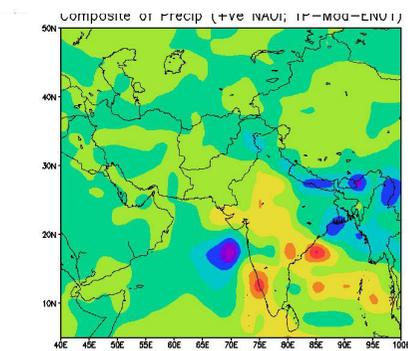
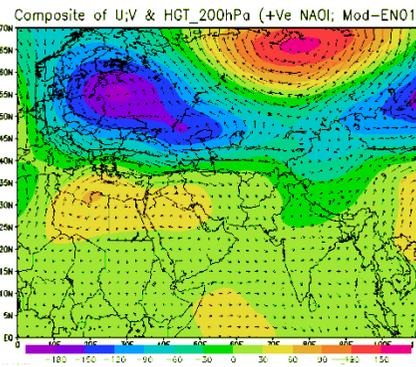
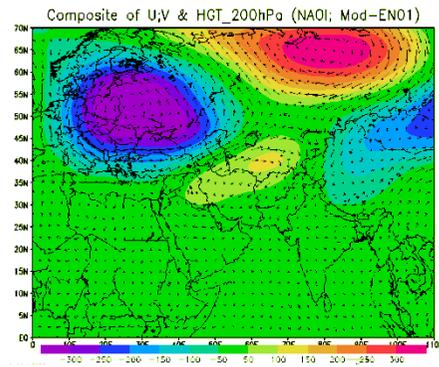
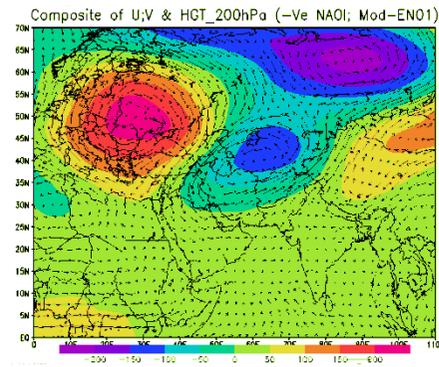
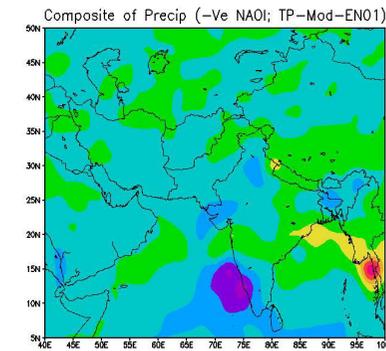
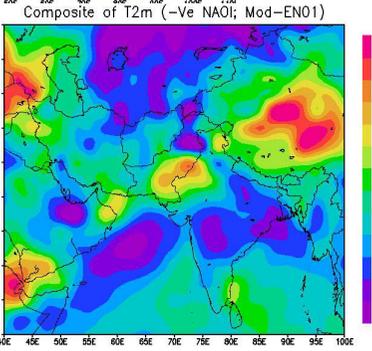
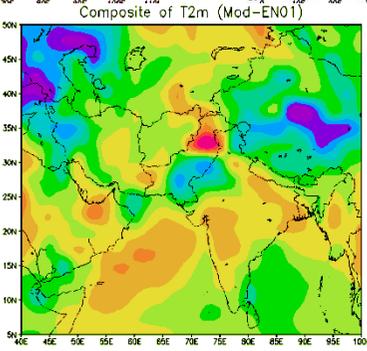
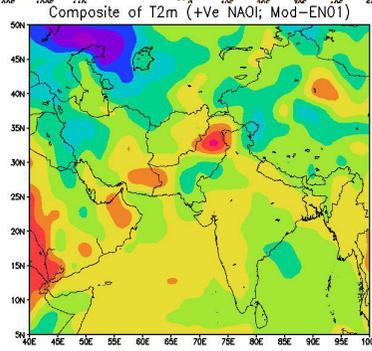
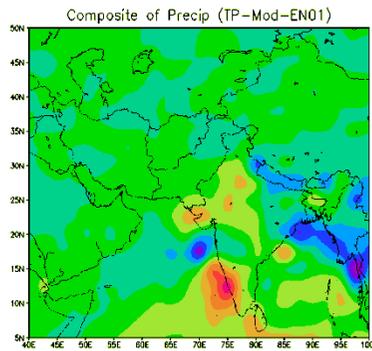
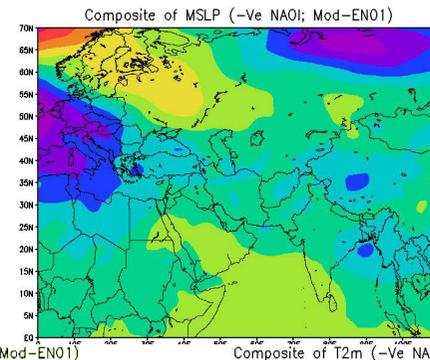
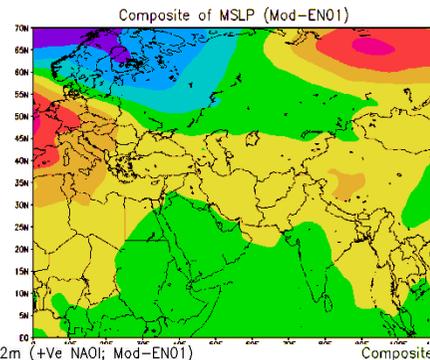
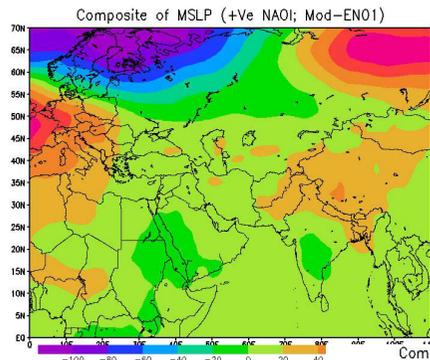


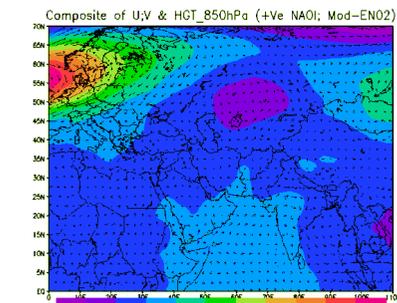
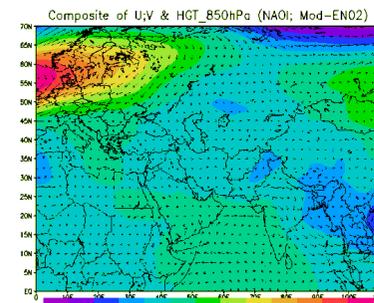
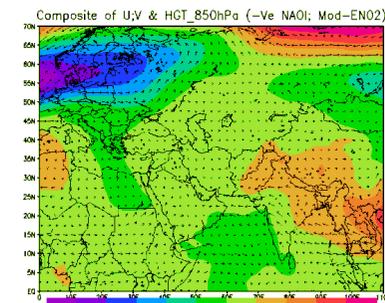
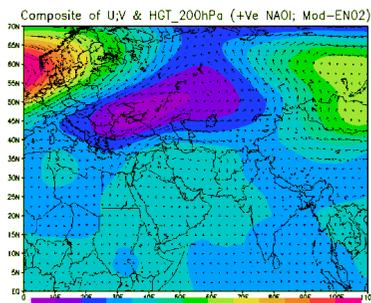
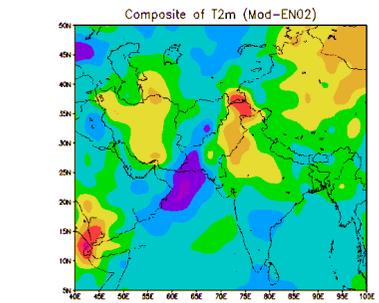
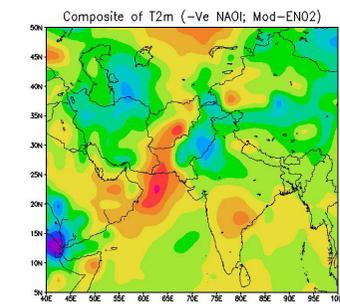
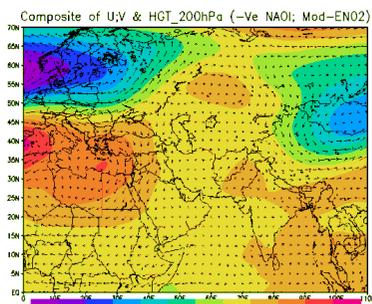
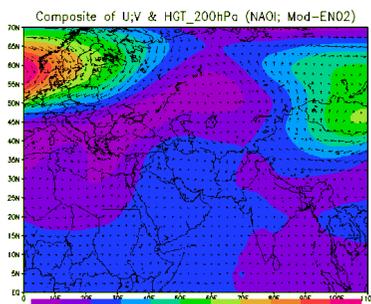
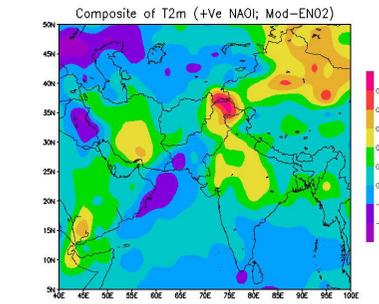
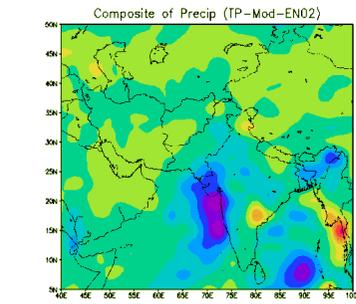
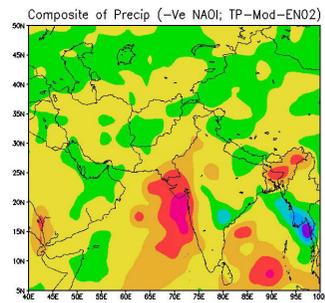
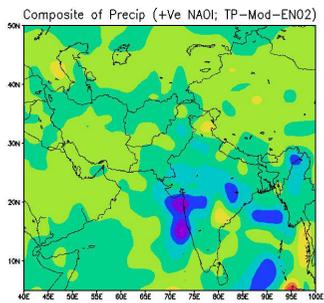
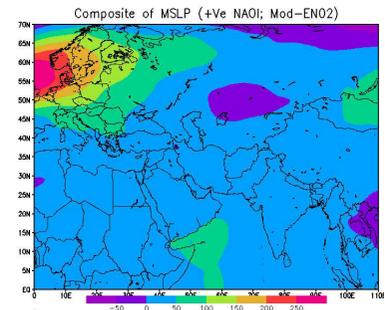
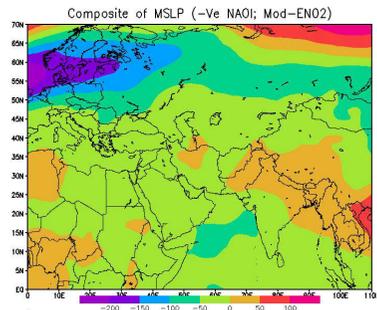
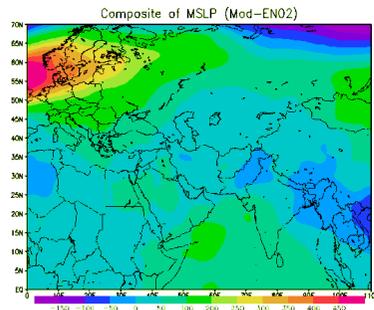
Composite of U;V & HGT_850hPa (NAOI; Obs; 1981-2012;)

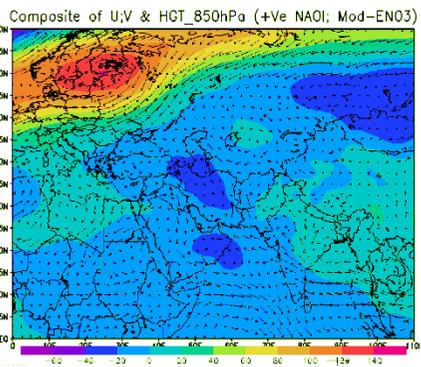
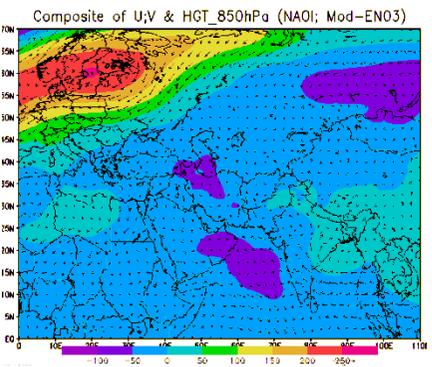
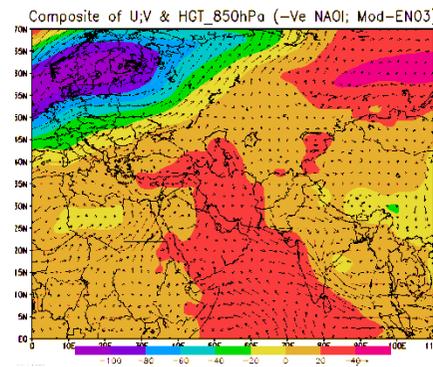
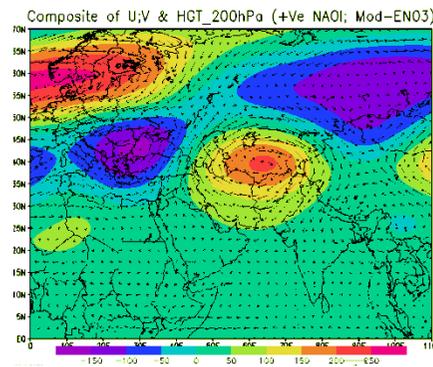
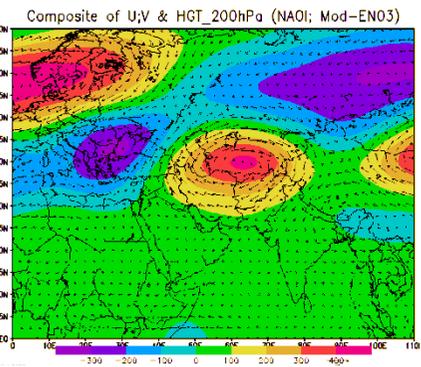
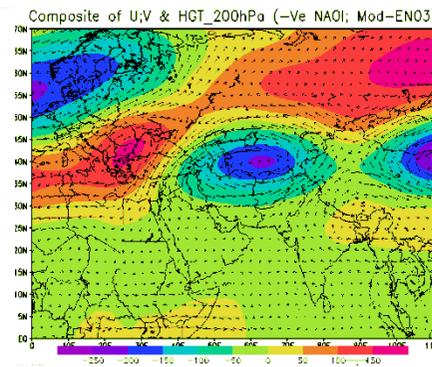
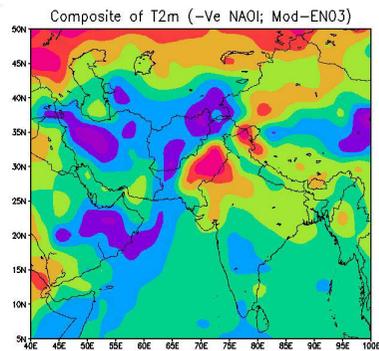
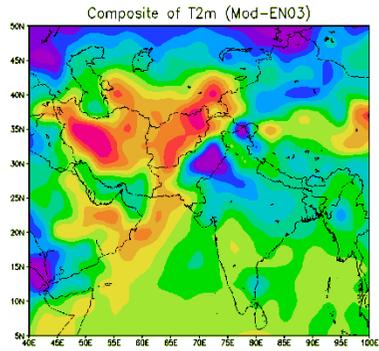
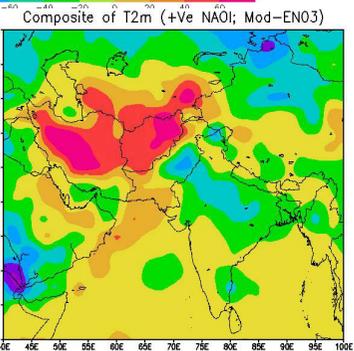
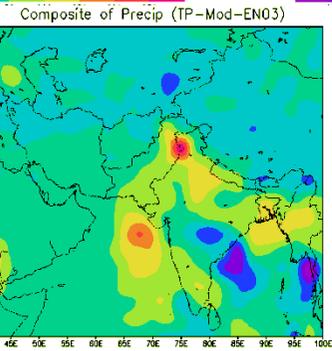
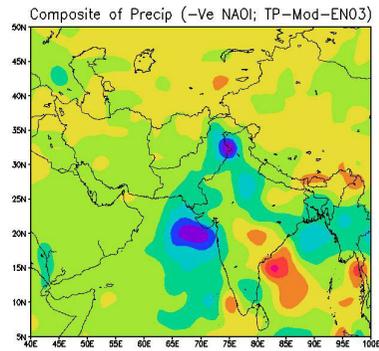
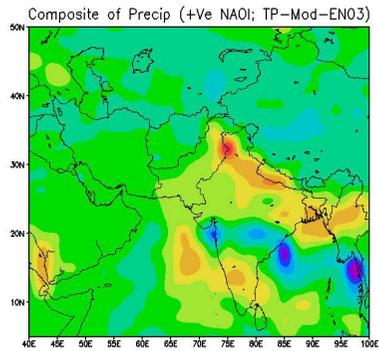
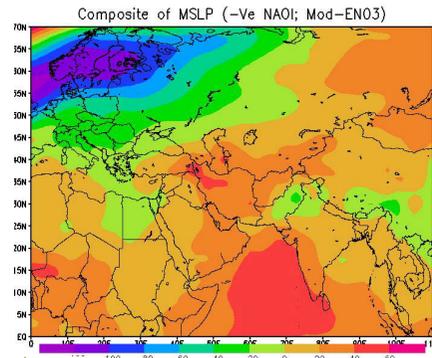
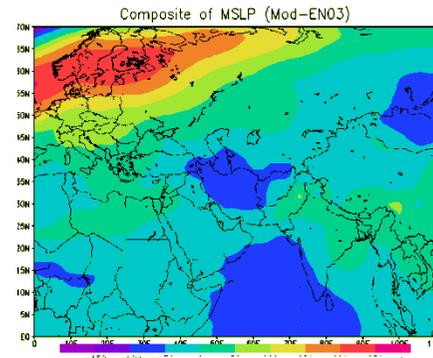
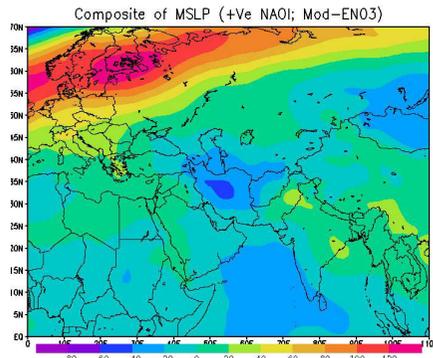


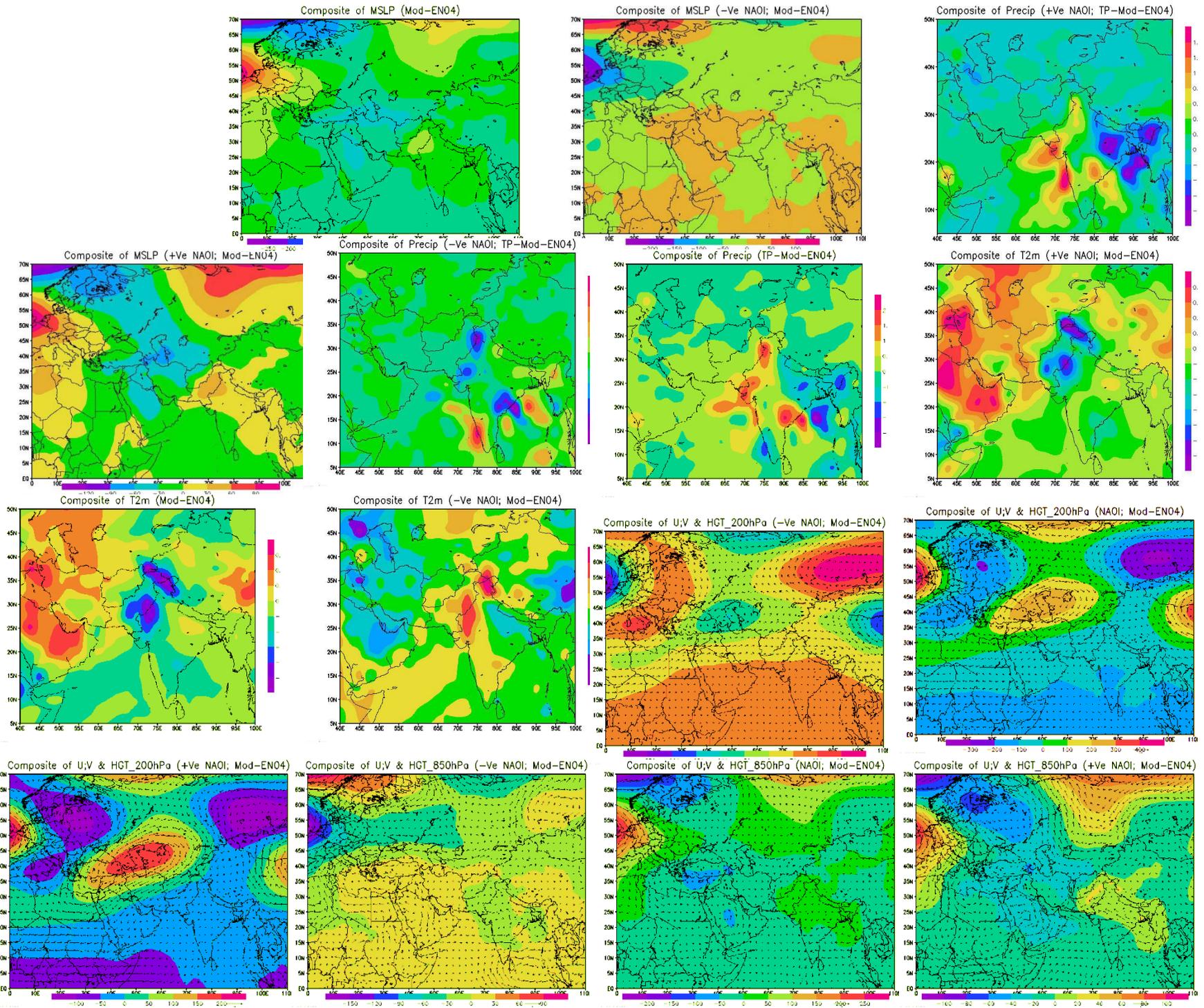
Composite of U;V & HGT_850hPa (+Ve NAOI; Obs; 1981-2012;)

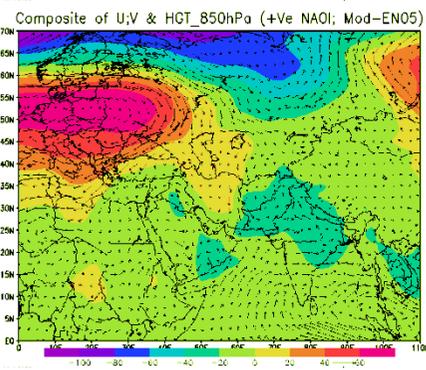
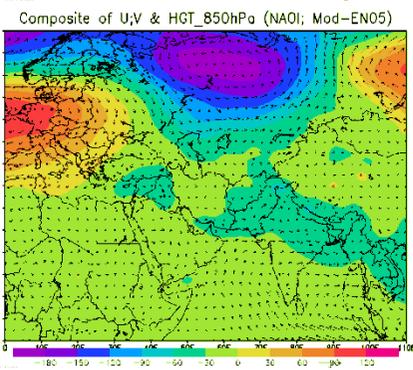
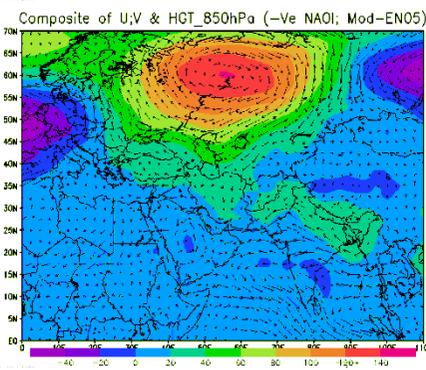
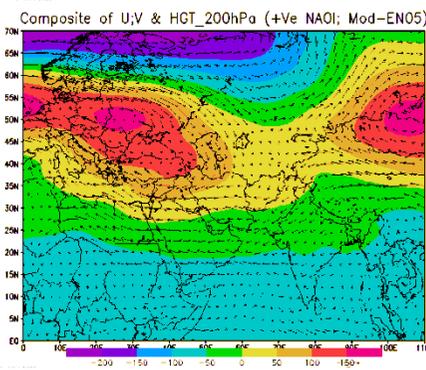
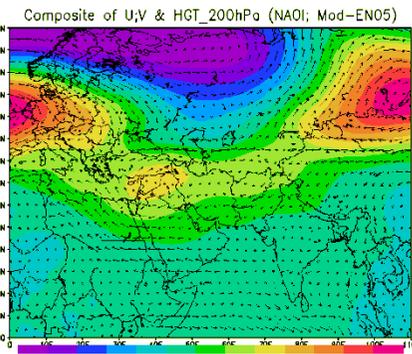
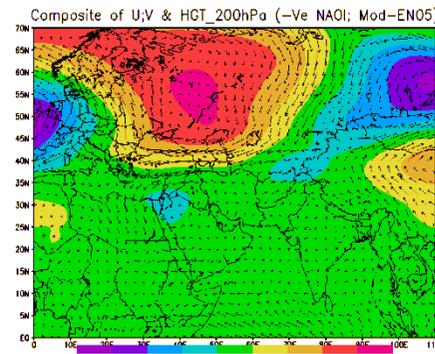
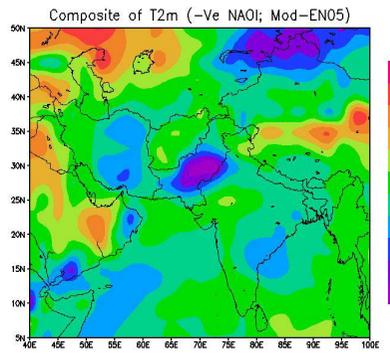
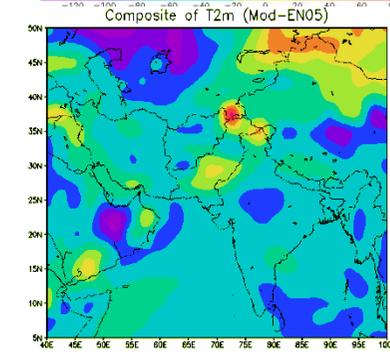
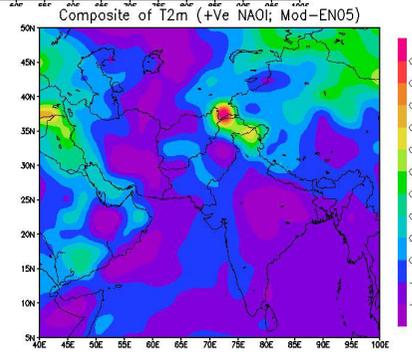
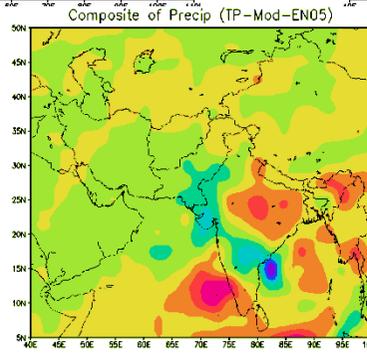
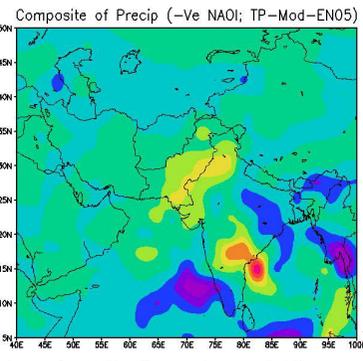
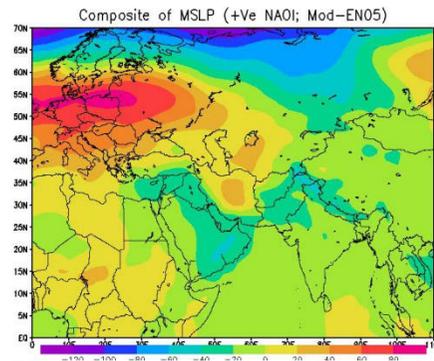
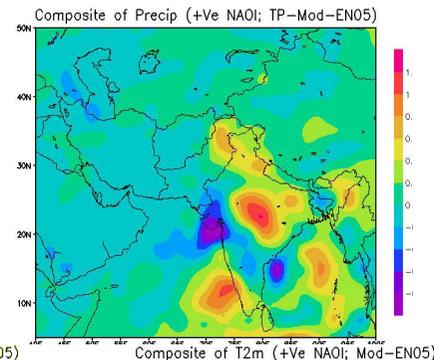
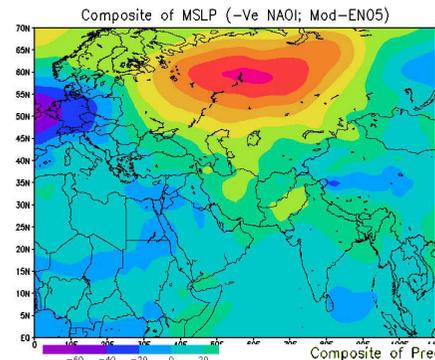
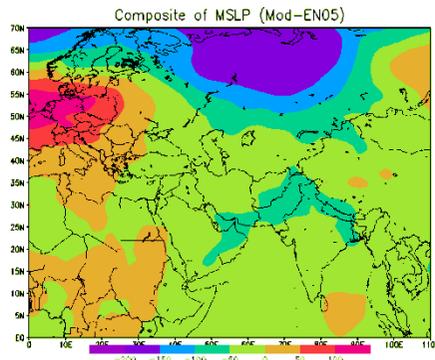


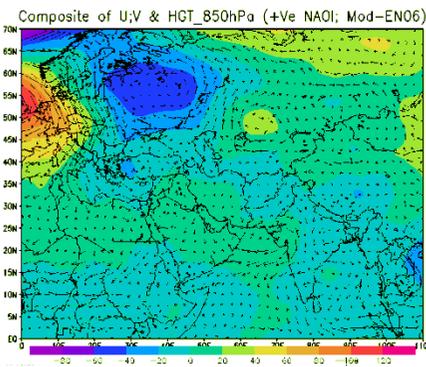
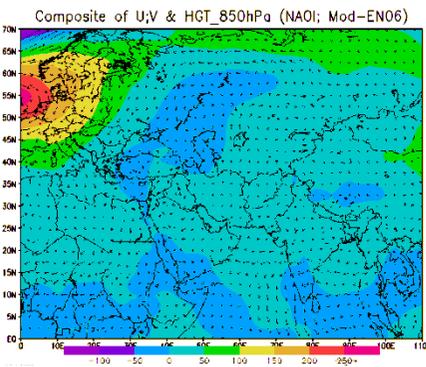
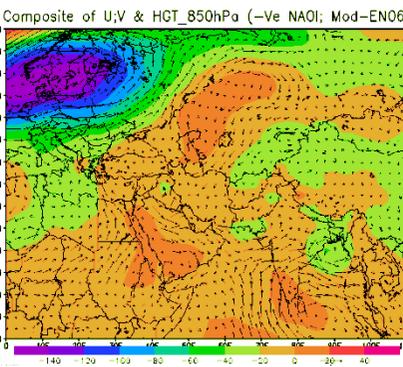
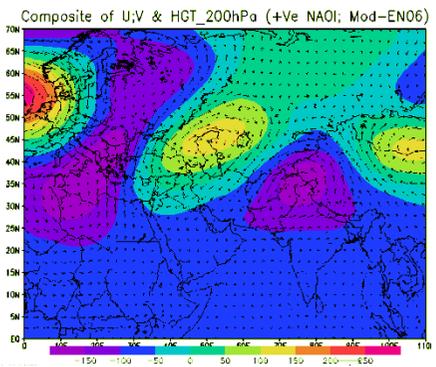
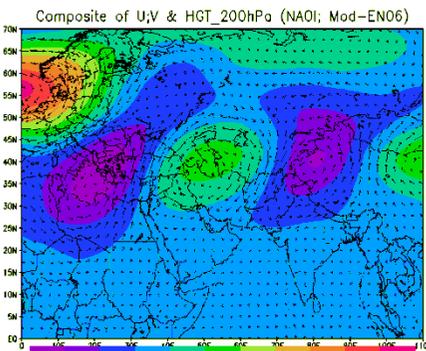
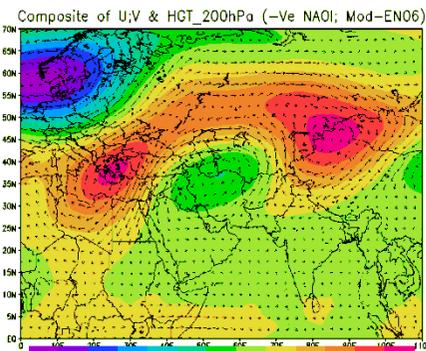
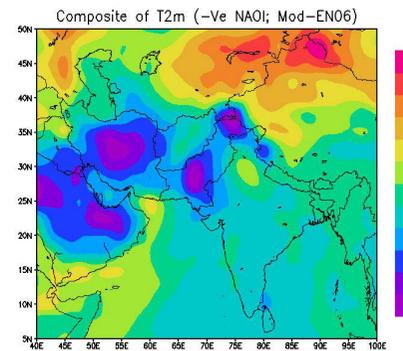
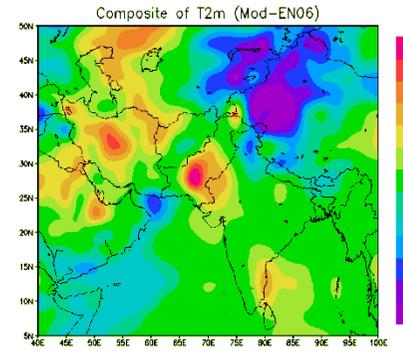
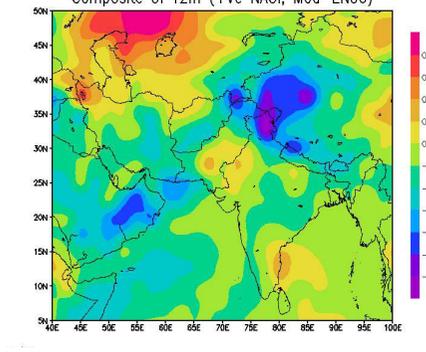
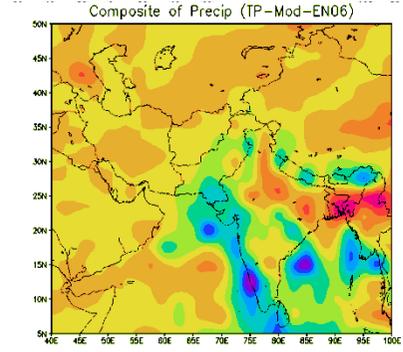
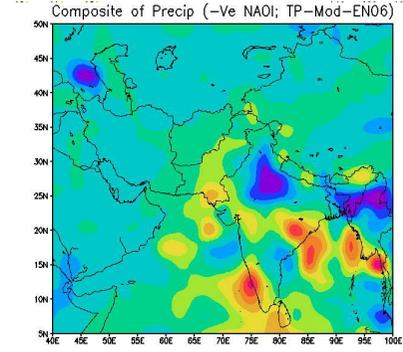
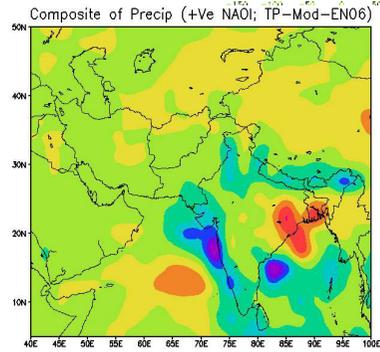
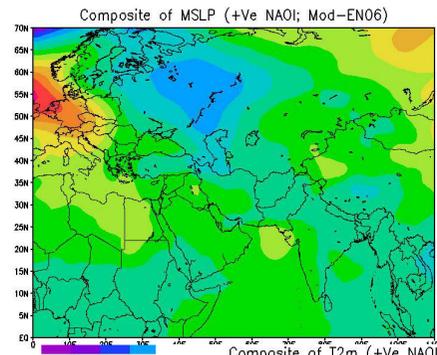
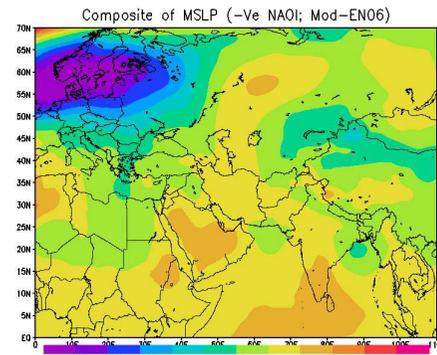
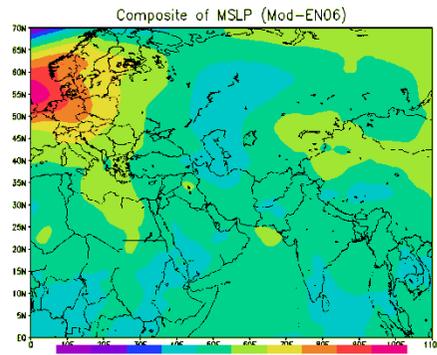




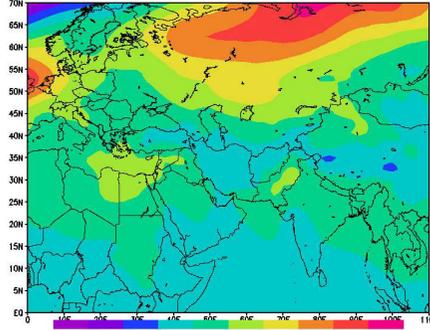




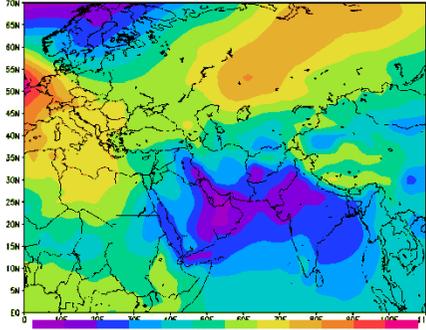




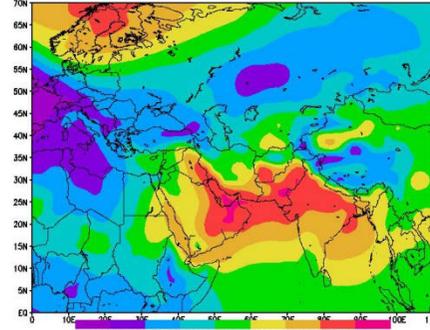
Composite of MSLP (+Ve NAO1; Mod-EN07)



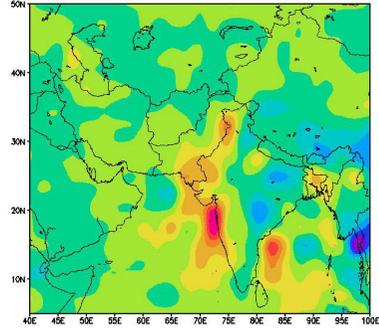
Composite of MSLP (Mod-EN07)



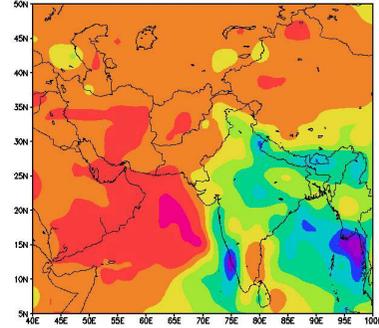
Composite of MSLP (-Ve NAO1; Mod-EN07)



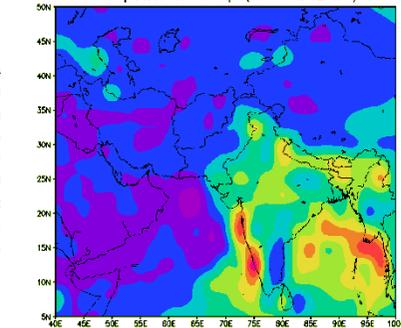
Composite of Precip (+Ve NAO1; TP-Mod-EN07)



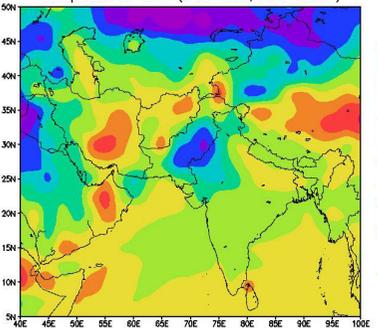
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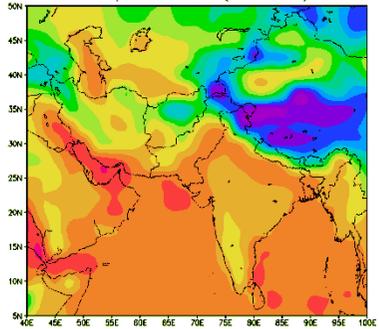
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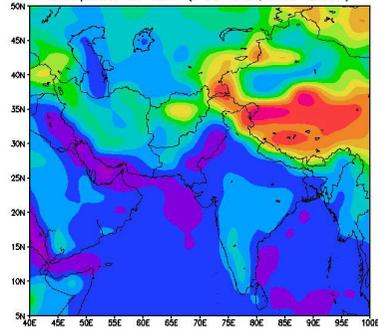
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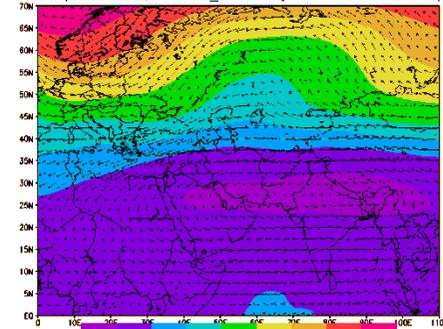
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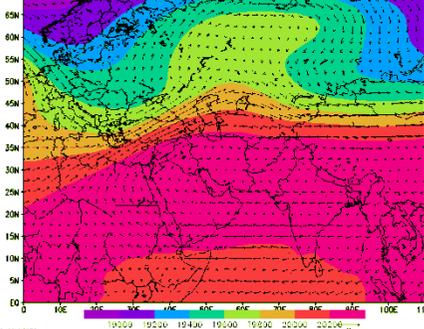
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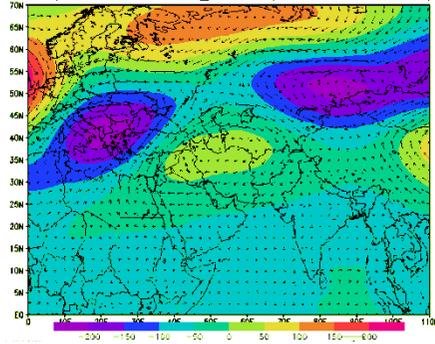
Composite of U;V & HGT_200hPa (-Ve NAO1; Mod-EN07)



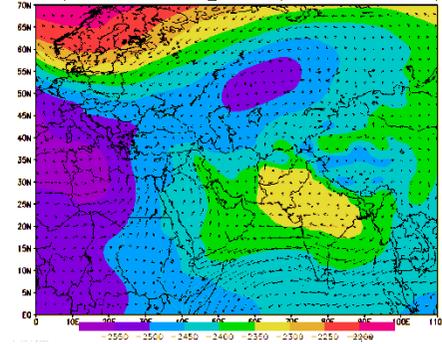
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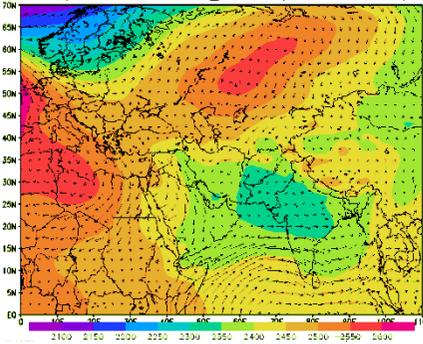
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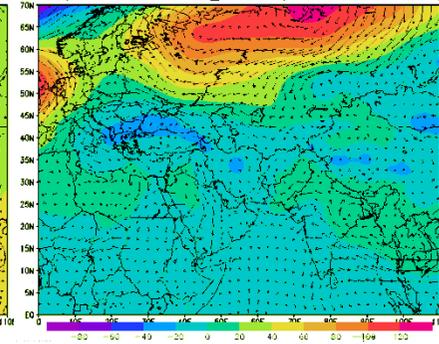
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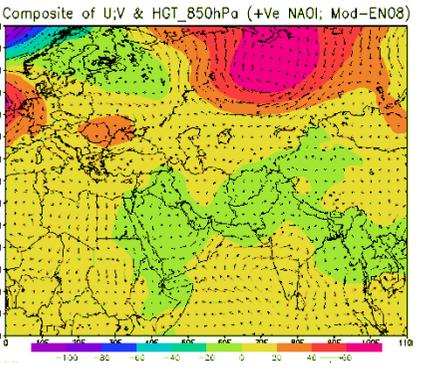
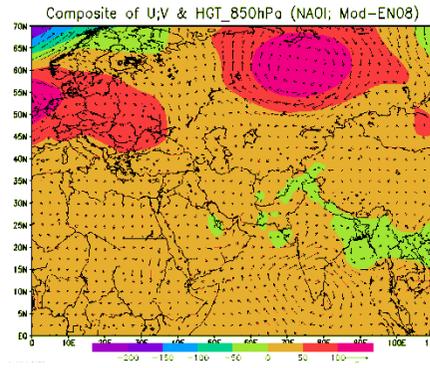
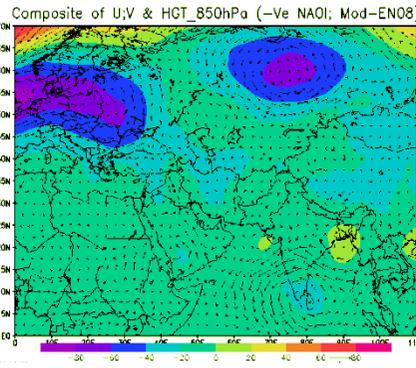
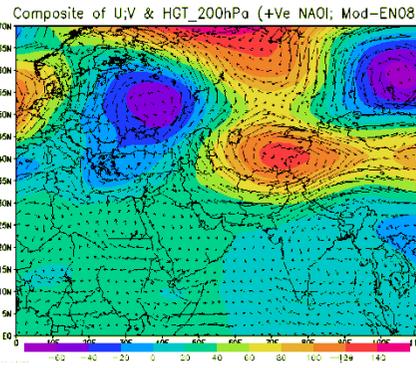
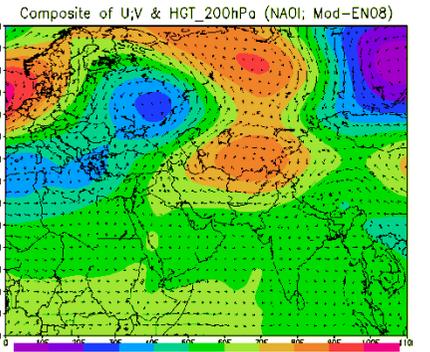
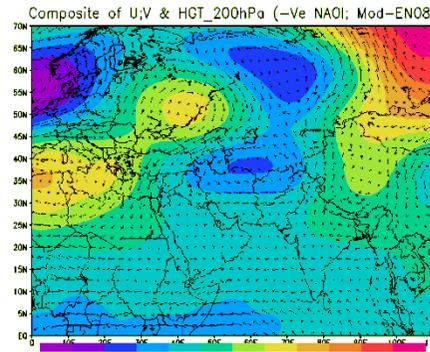
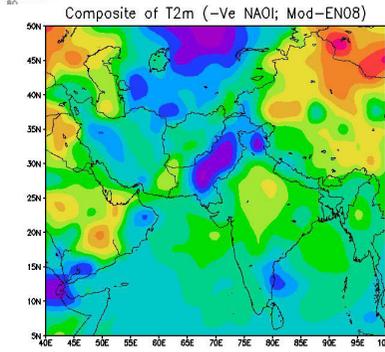
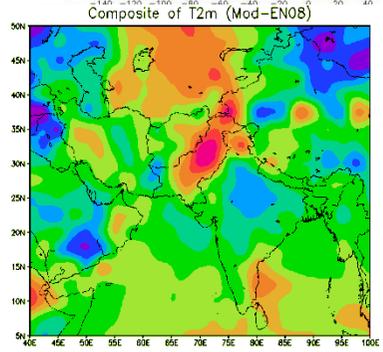
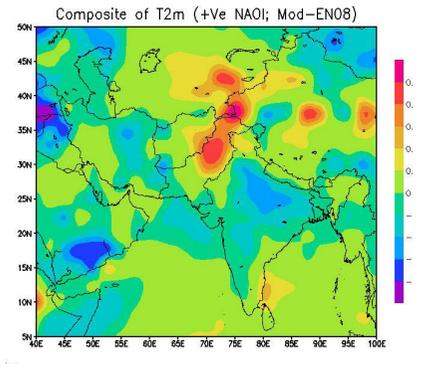
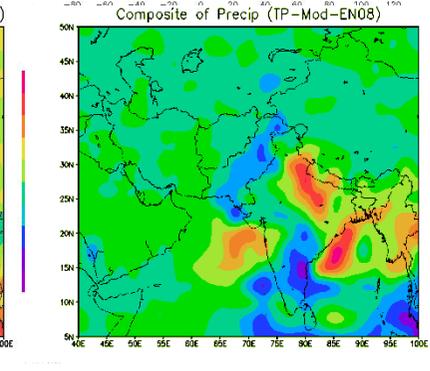
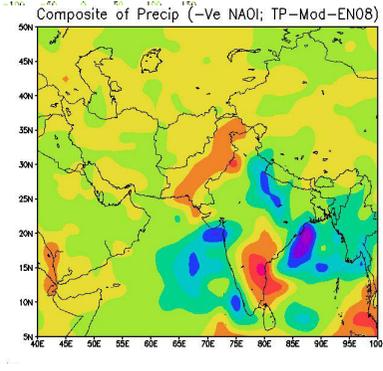
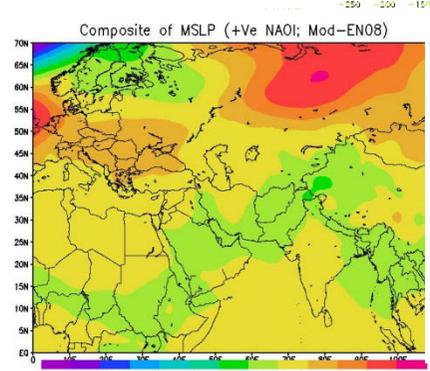
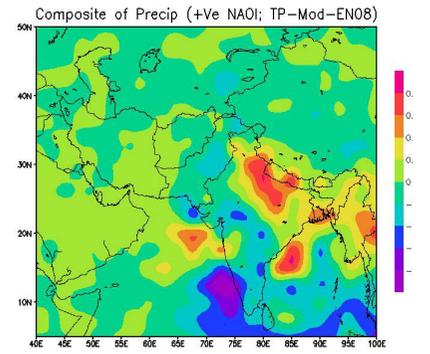
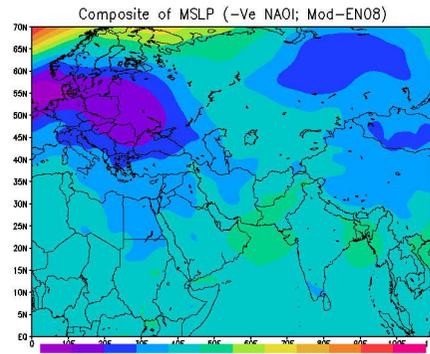
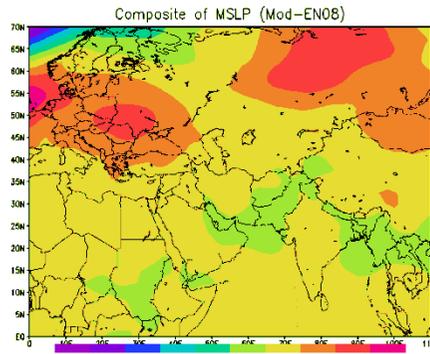


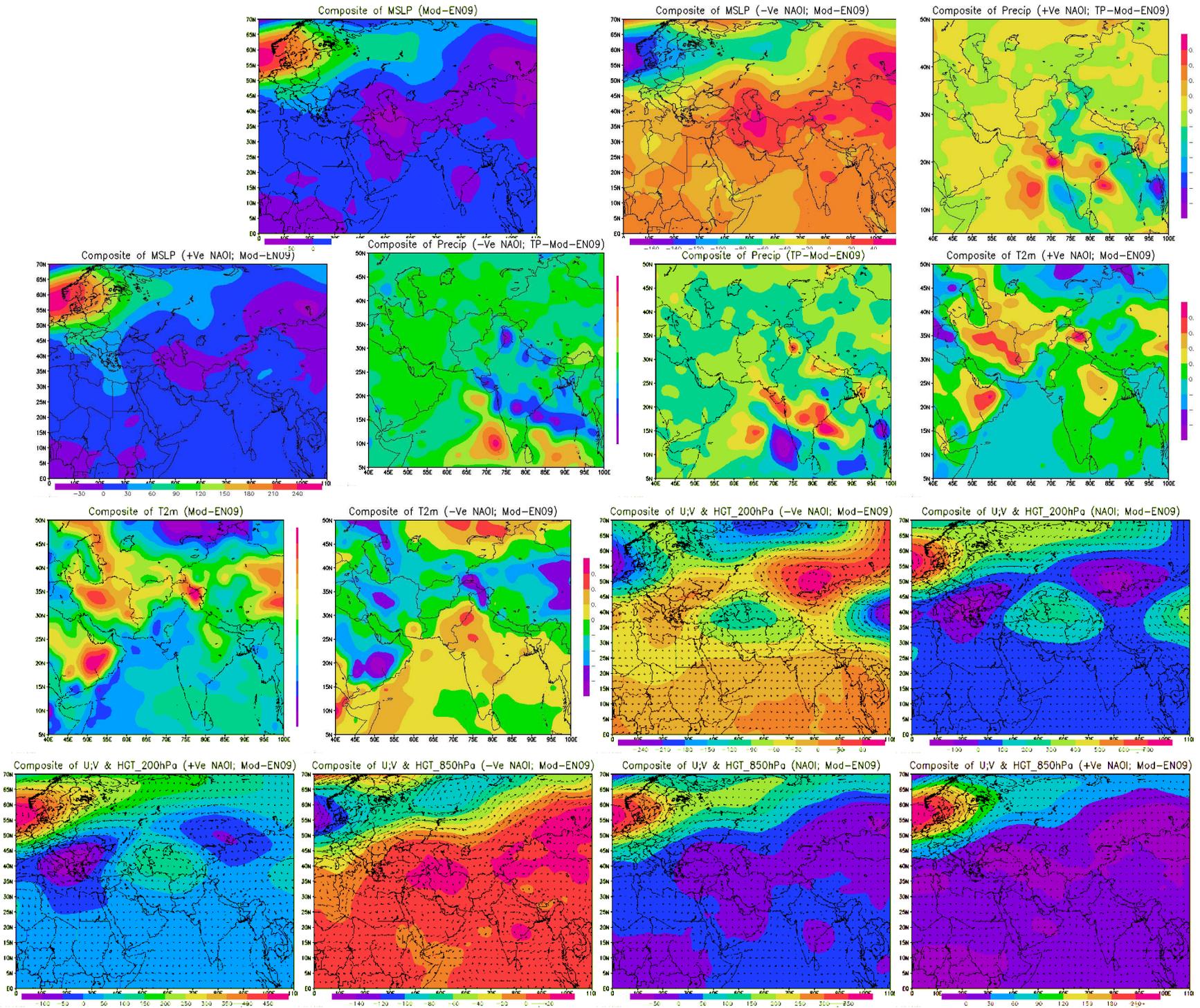
Composite of U;V & HGT_850hPa (NAOI; Mod-EN07)

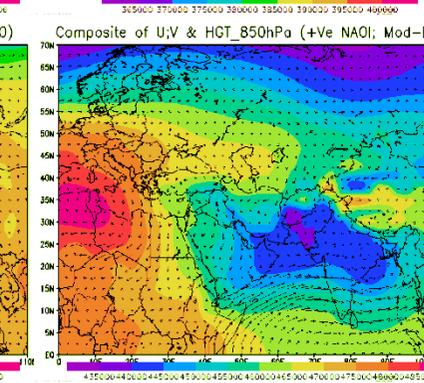
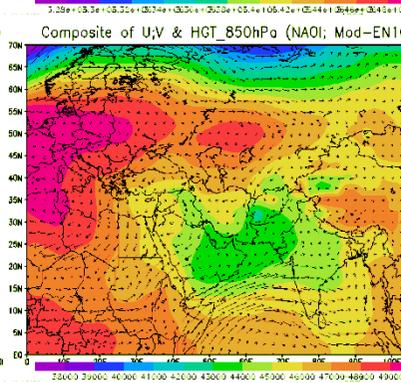
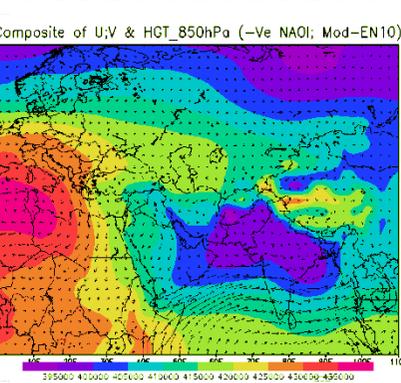
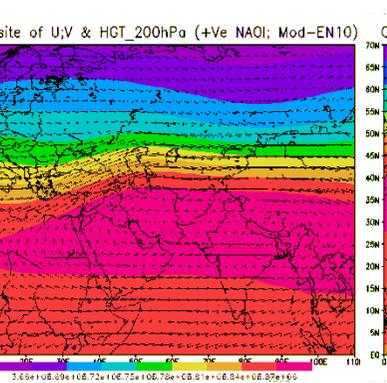
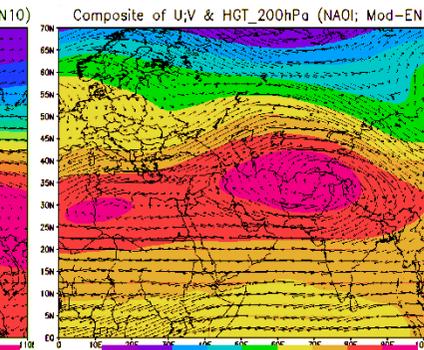
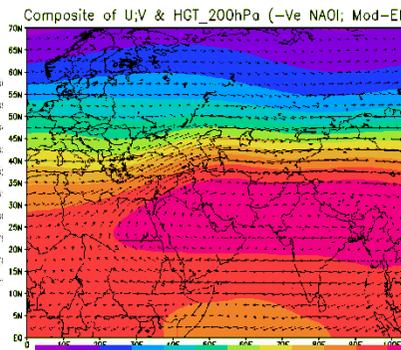
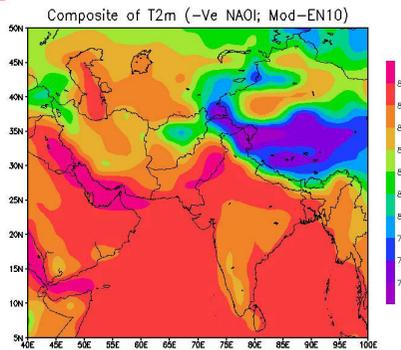
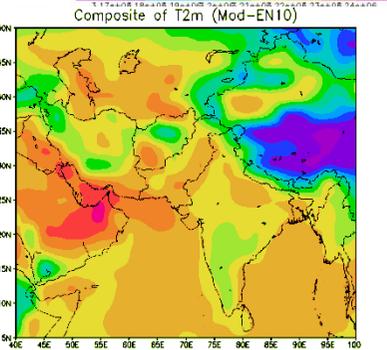
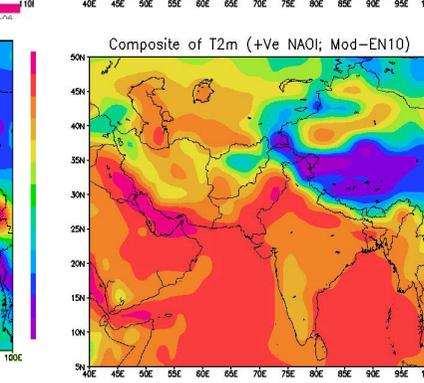
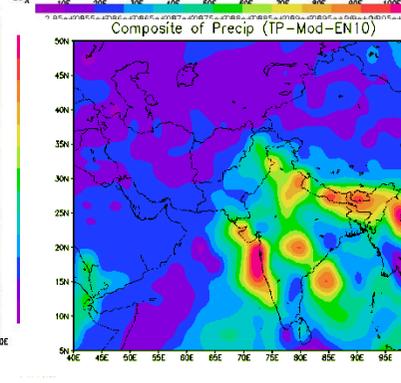
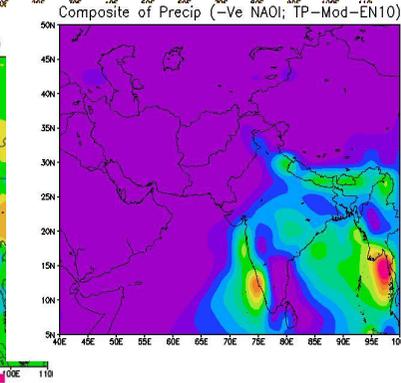
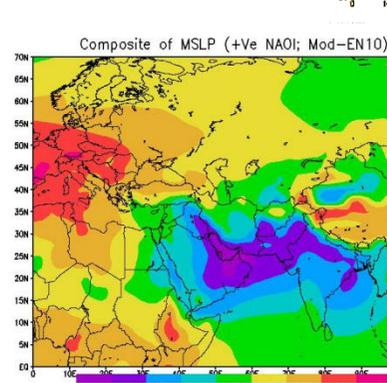
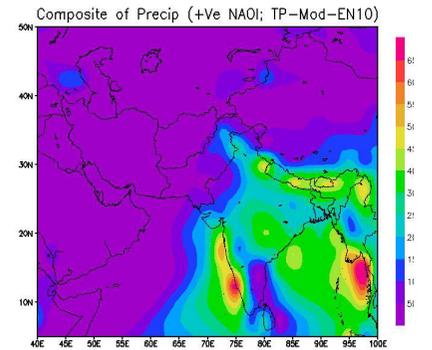
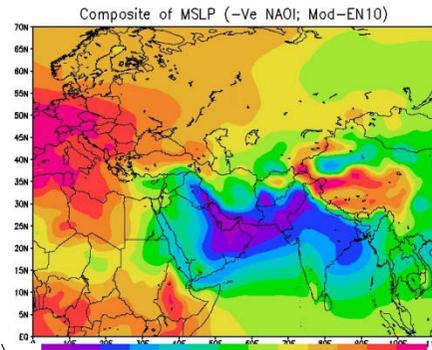
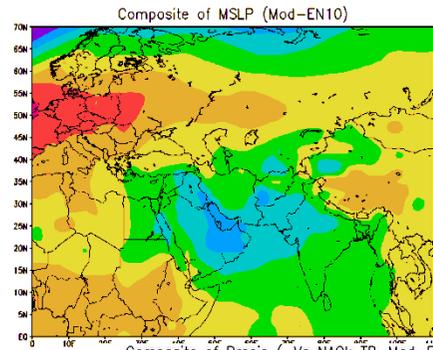


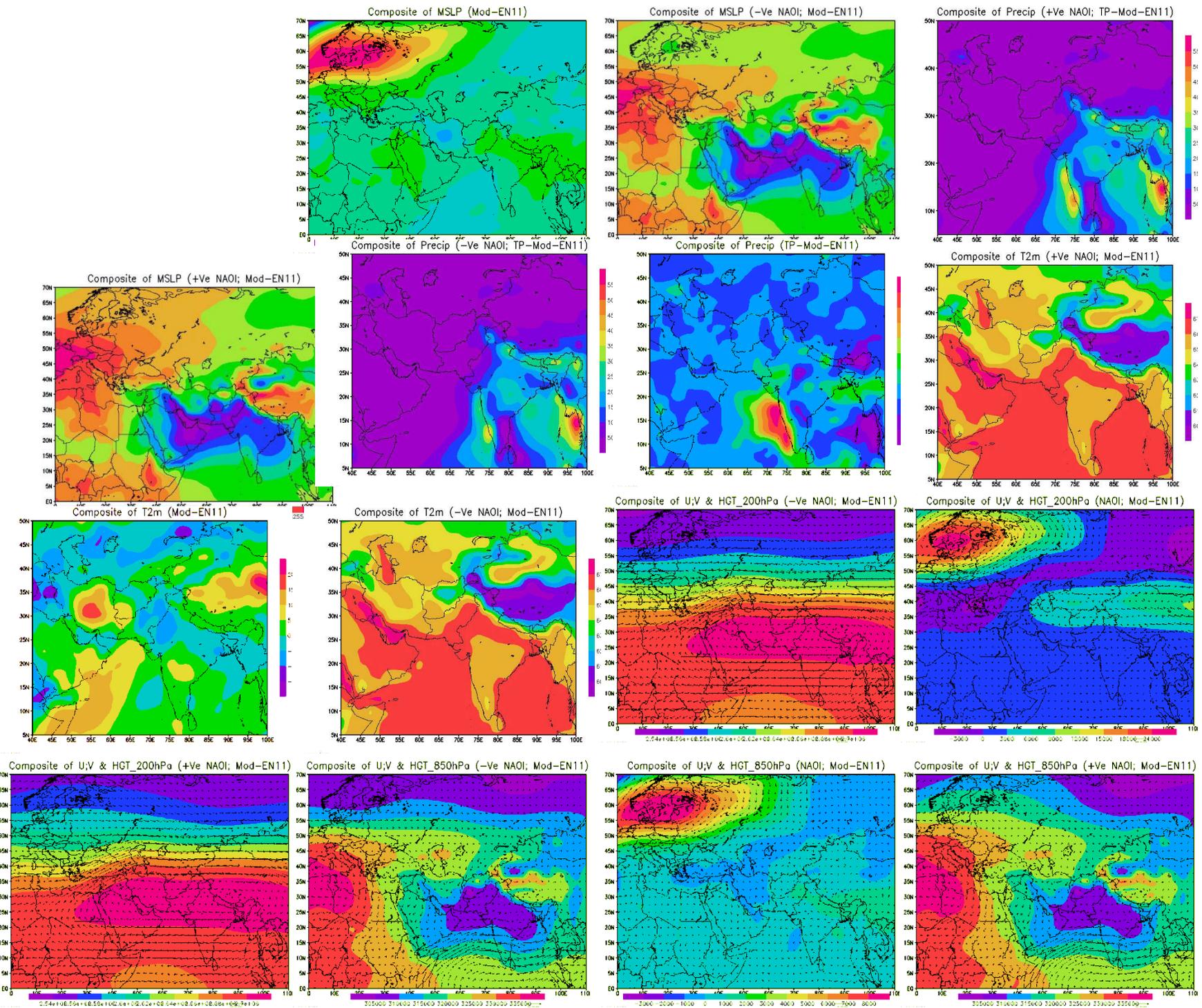
Composite of U;V & HGT_850hPa (+Ve NAO1; Mod-EN07)

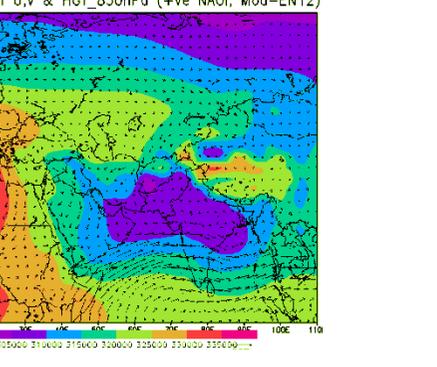
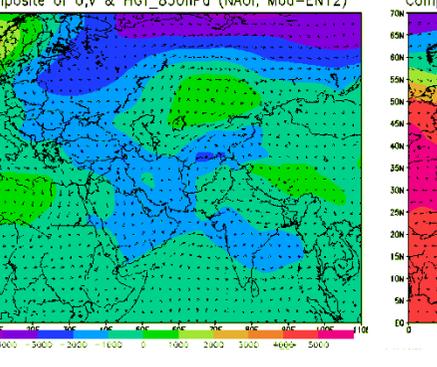
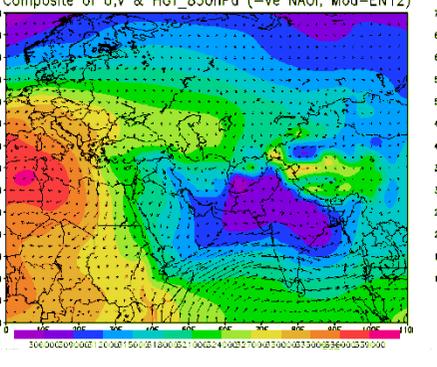
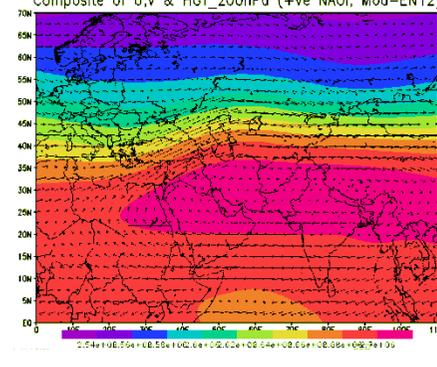
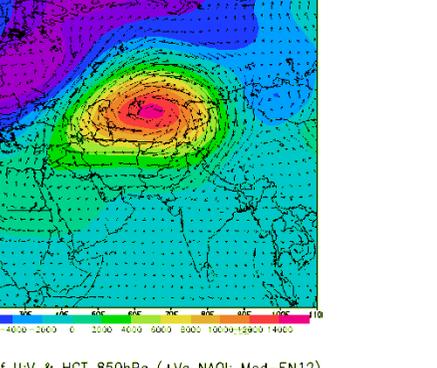
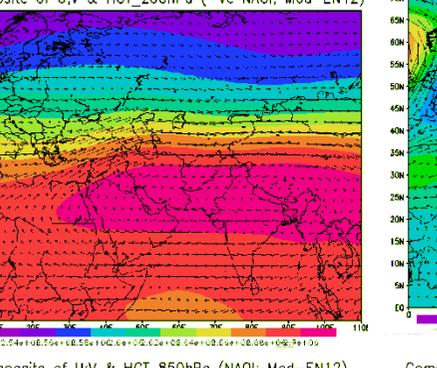
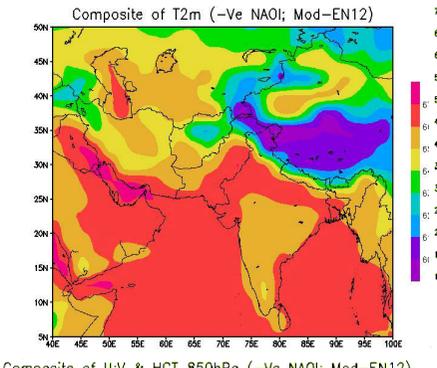
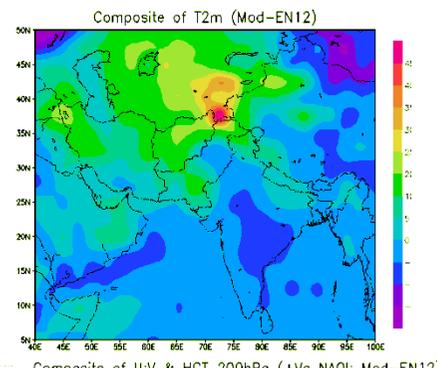
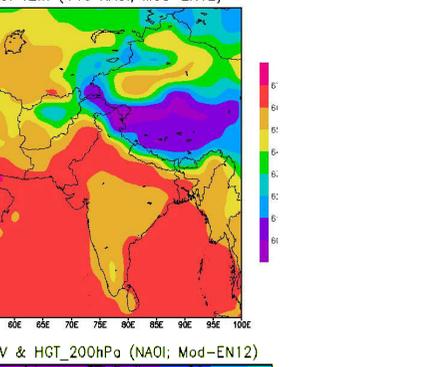
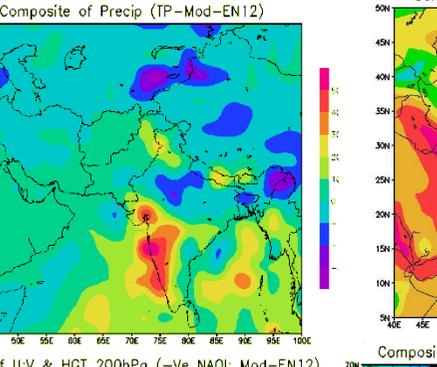
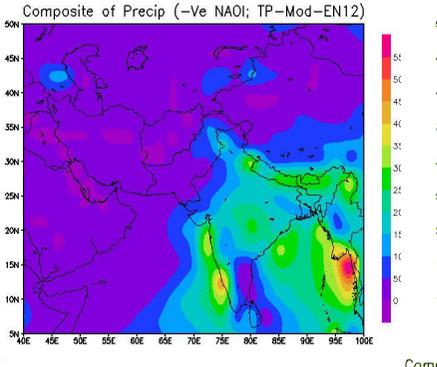
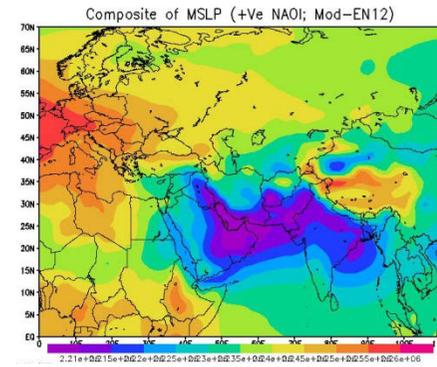
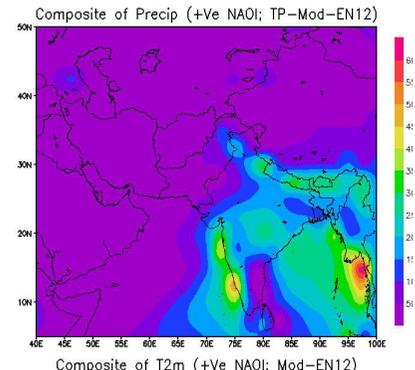
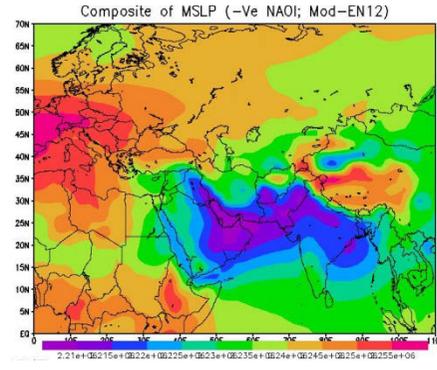
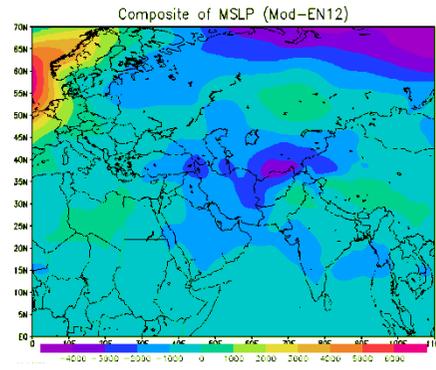




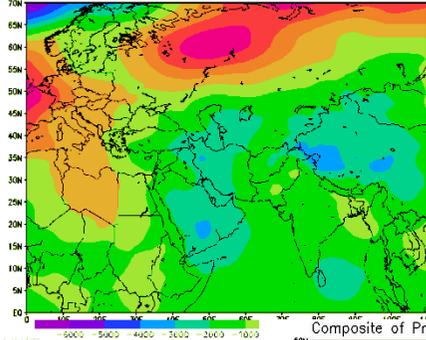




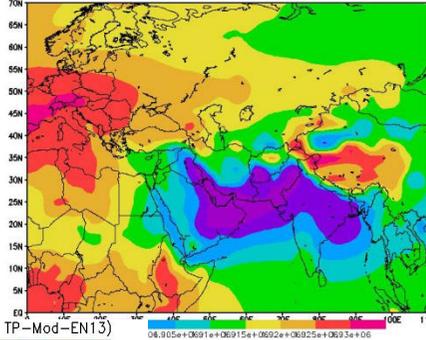




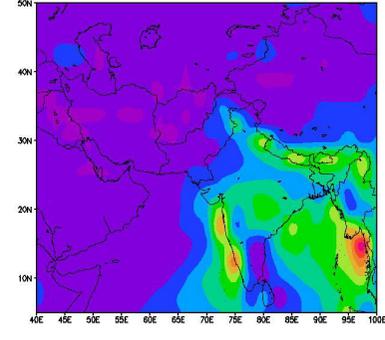
Composite of MSLP (Mod-EN13)



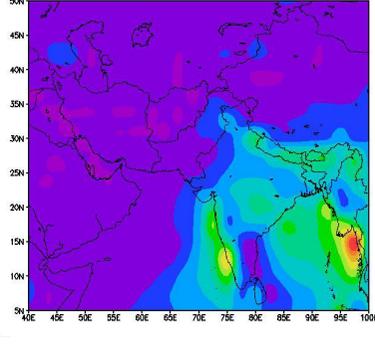
Composite of MSLP (-Ve NAO1; Mod-EN13)



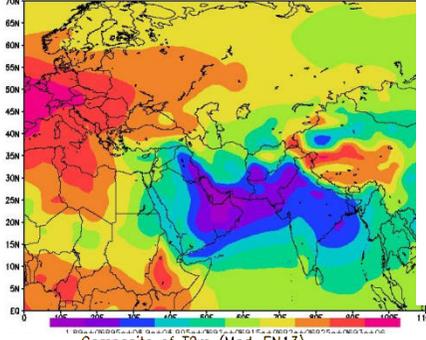
Composite of Precip (+Ve NAO1; TP-Mod-EN13)



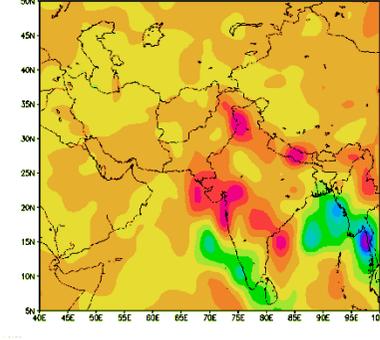
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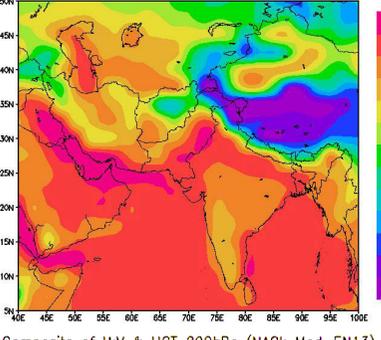
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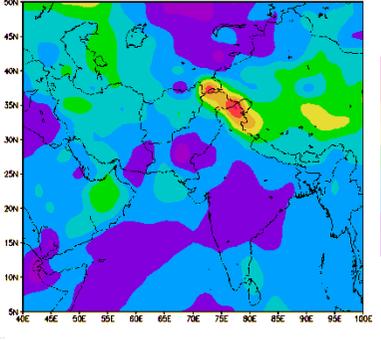
Composite of Precip (TP-Mod-EN13)



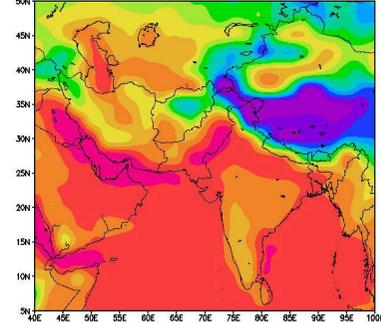
Composite of T2m (+Ve NAO1; Mod-EN13)



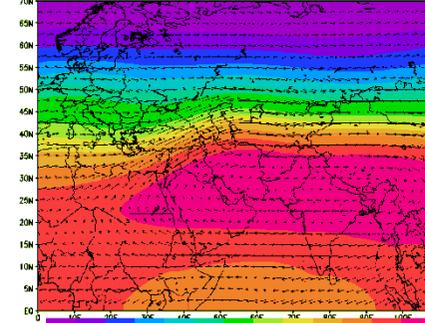
Composite of T2m (Mod-EN13)



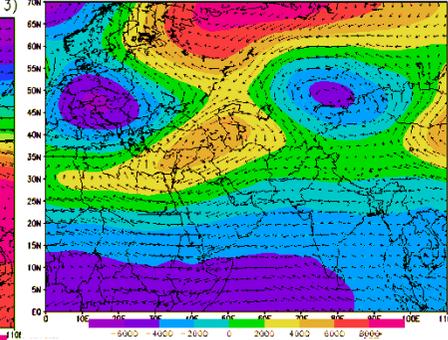
Composite of T2m (-Ve NAO1; Mod-EN13)



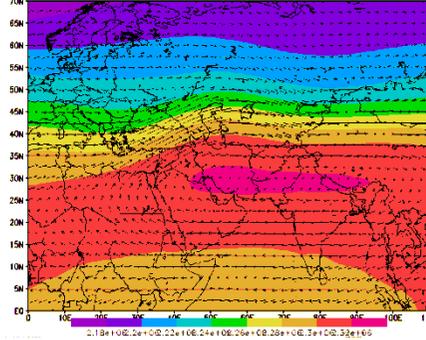
Composite of U;V & HGT_200hPa (-Ve NAO1; Mod-EN13)



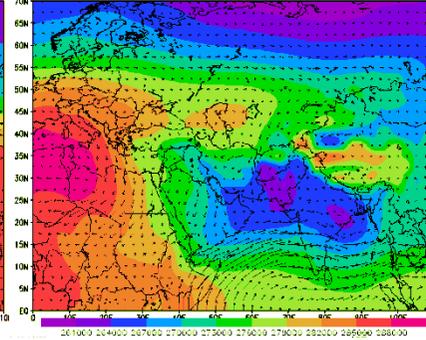
Composite of U;V & HGT_200hPa (NAO1; Mod-EN13)



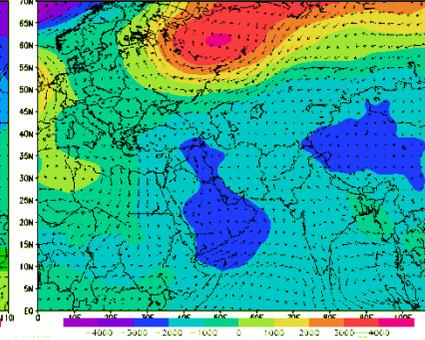
Composite of U;V & HGT_200hPa (+Ve NAO1; Mod-EN13)



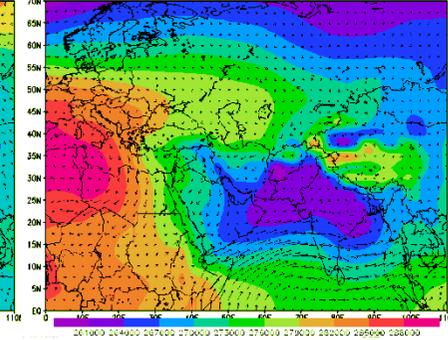
Composite of U;V & HGT_850hPa (-Ve NAO1; Mod-EN13)

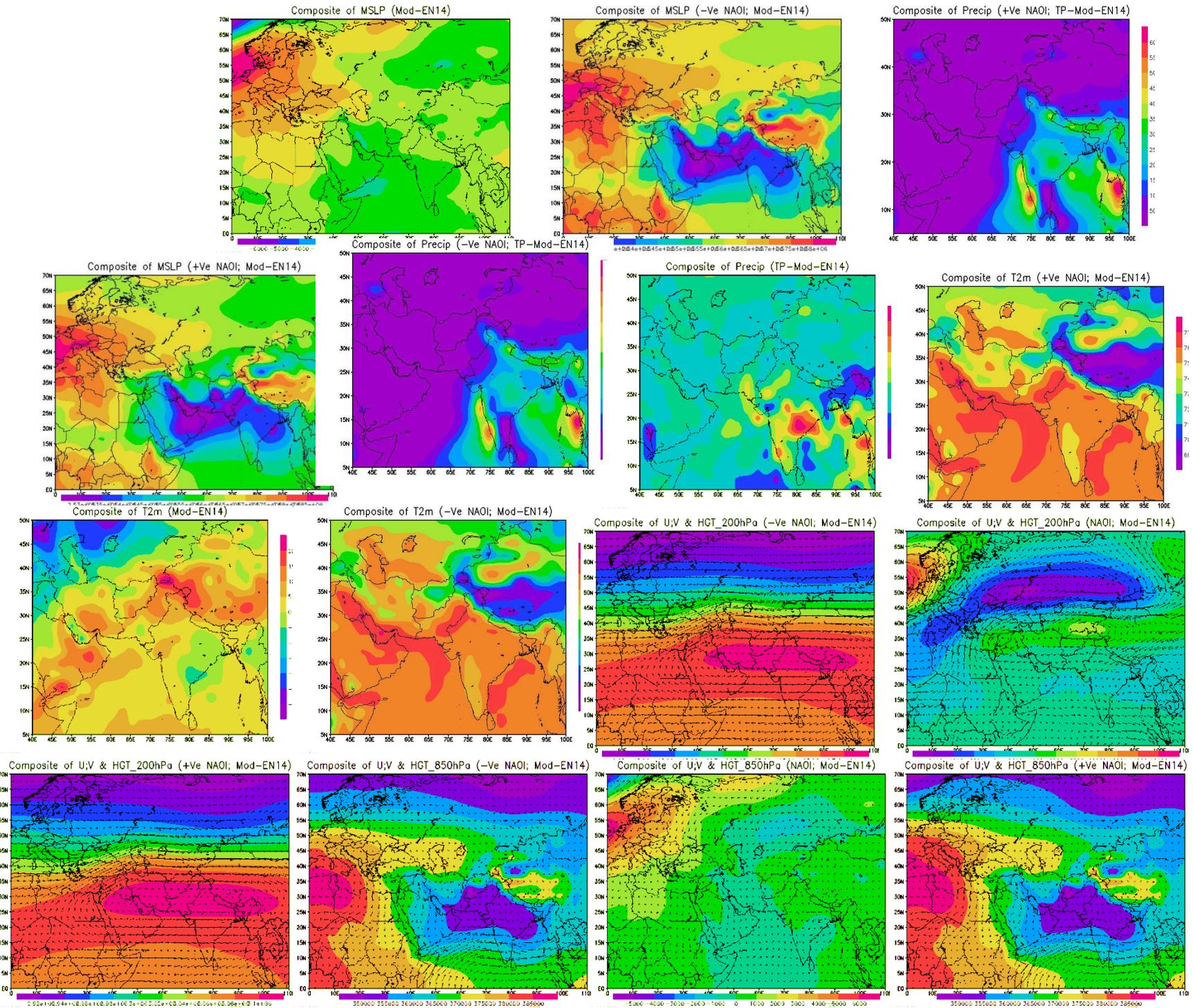


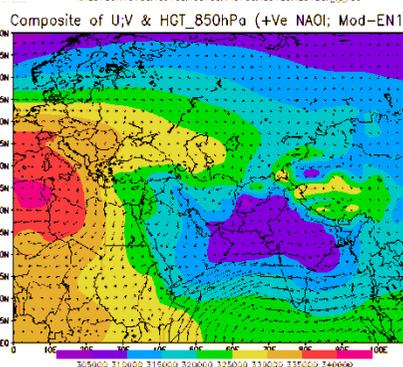
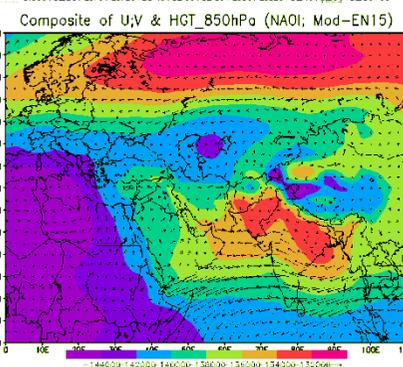
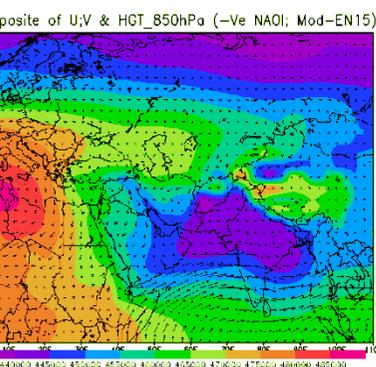
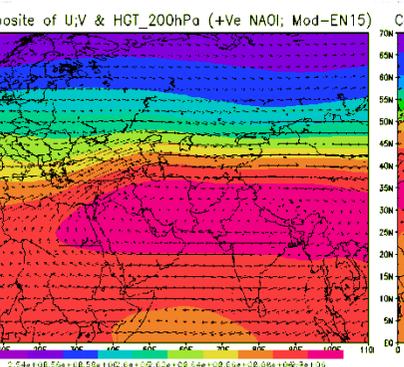
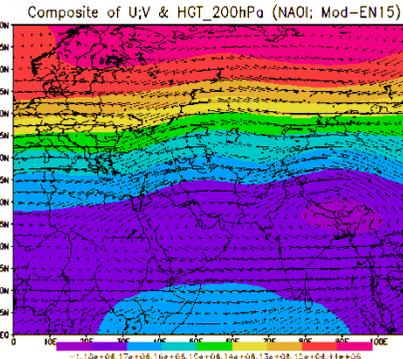
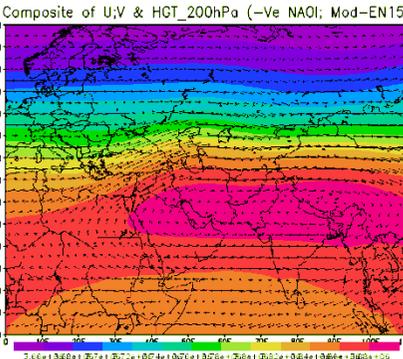
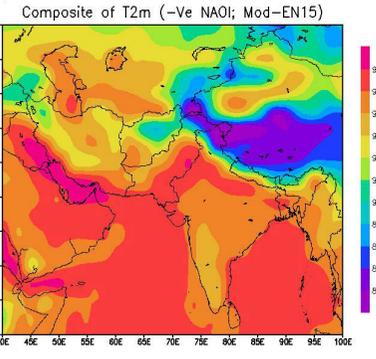
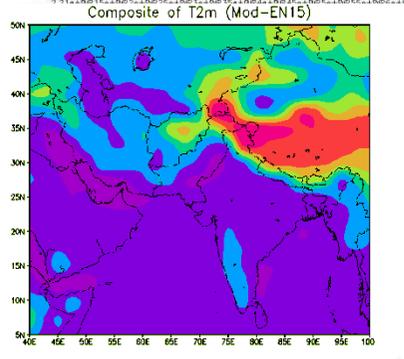
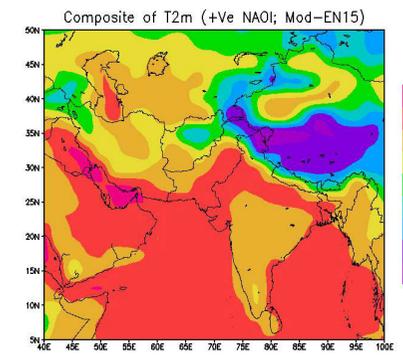
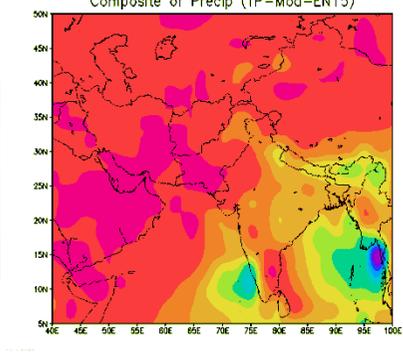
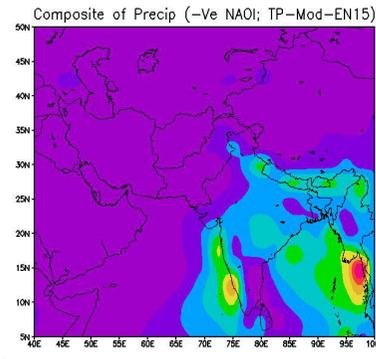
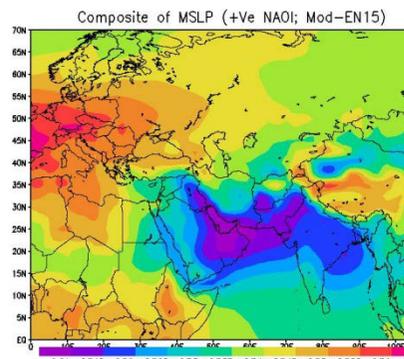
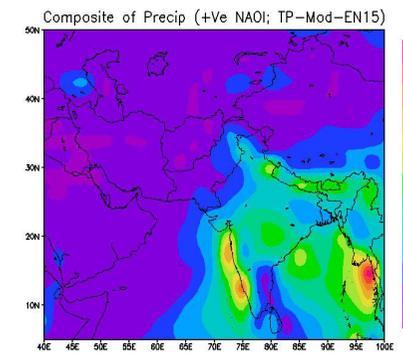
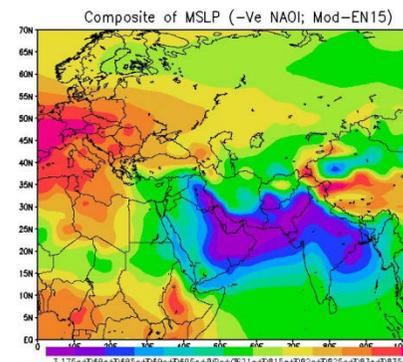
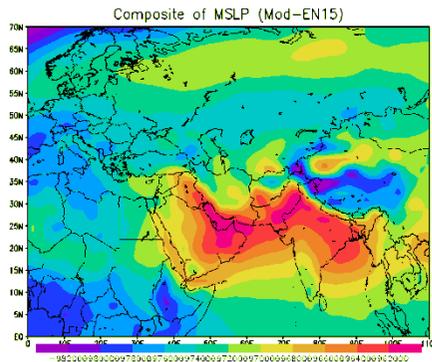
Composite of U;V & HGT_850hPa (NAO1; Mod-EN13)



Composite of U;V & HGT_850hPa (+Ve NAO1; Mod-EN13)







Summary

- All the ensemble members capture the overall precipitation and temperature mean climatology patterns quite well.