A Comparison of the Outgoing Longwave Radiation (OLR) from the CORe and the CPC Blended OLR (CBO)

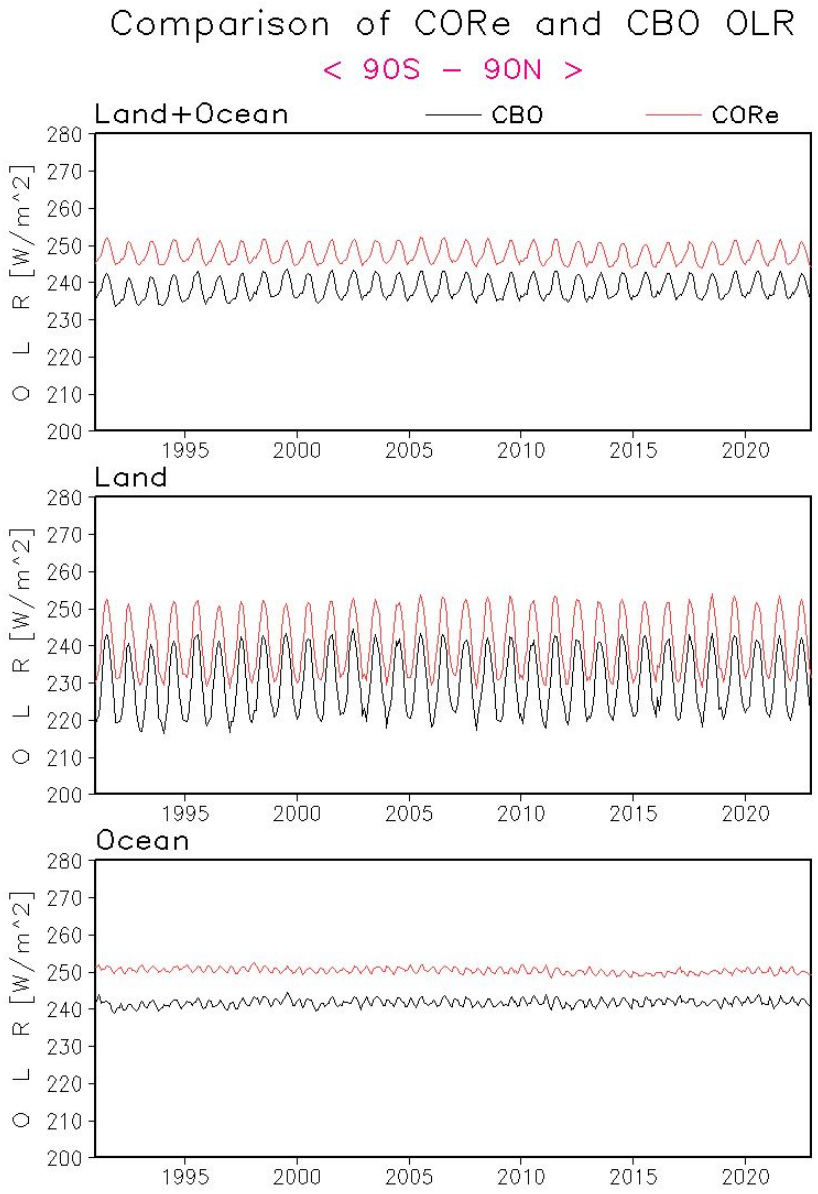
2023-09-08

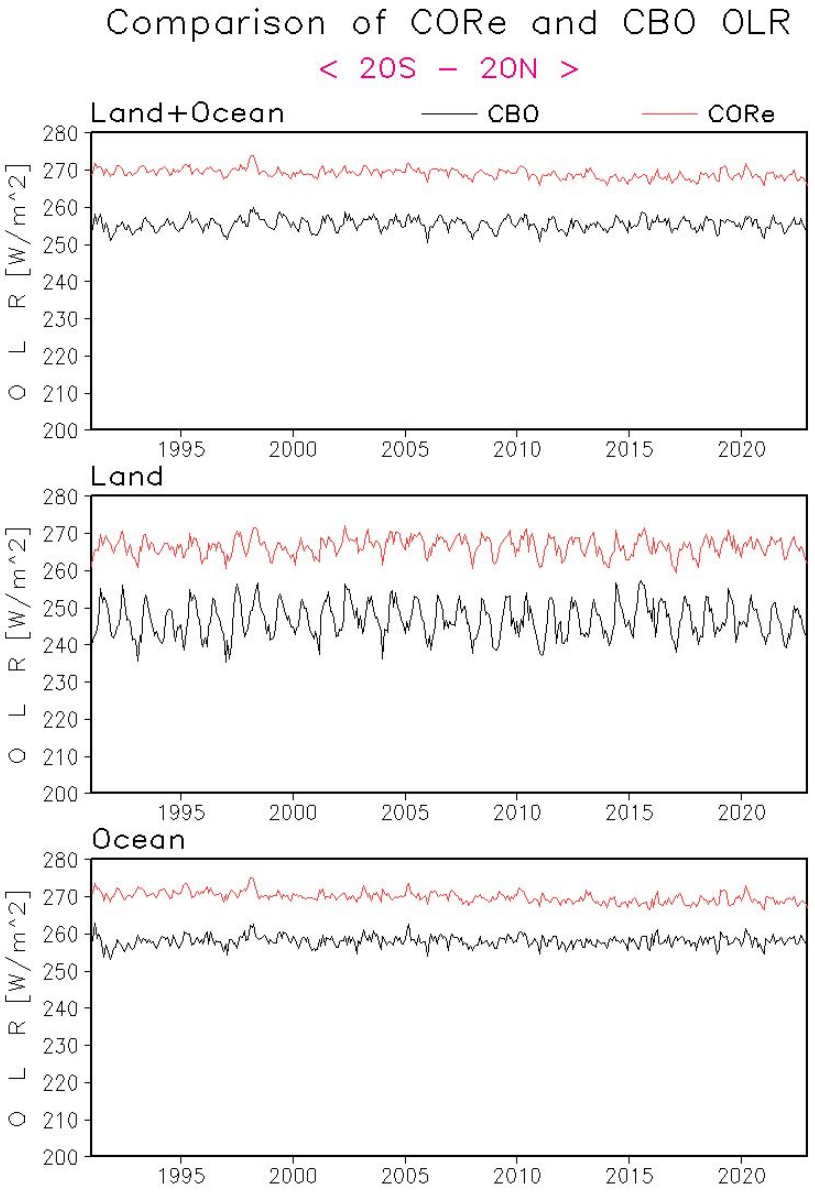
How the Comparison is Conducted

- The new CPC observation based OLR data set, called CPC Blended OLR (CBO) are aggregated spatially from its native grid of 0.25ºlat/lon to the CORe Gussian grid of 512x256;
- Daily, pentad, and monthly fields of global OLR from the CORe and the CBO are compared to examine how 1991-2020 30-year climatology and anomalies are represented;
- Comparisons are conducted for a 32-year period from January 1991 to December 2022;
- In defining 1991-2020 30-year climatology at a Gussian grid point, 365-day time series of 30-year mean daily OLR at the point are computed and subjected to a harmonic analysis. The summation of the first 6 harmonics is taken as the daily climatology;

Total OLR

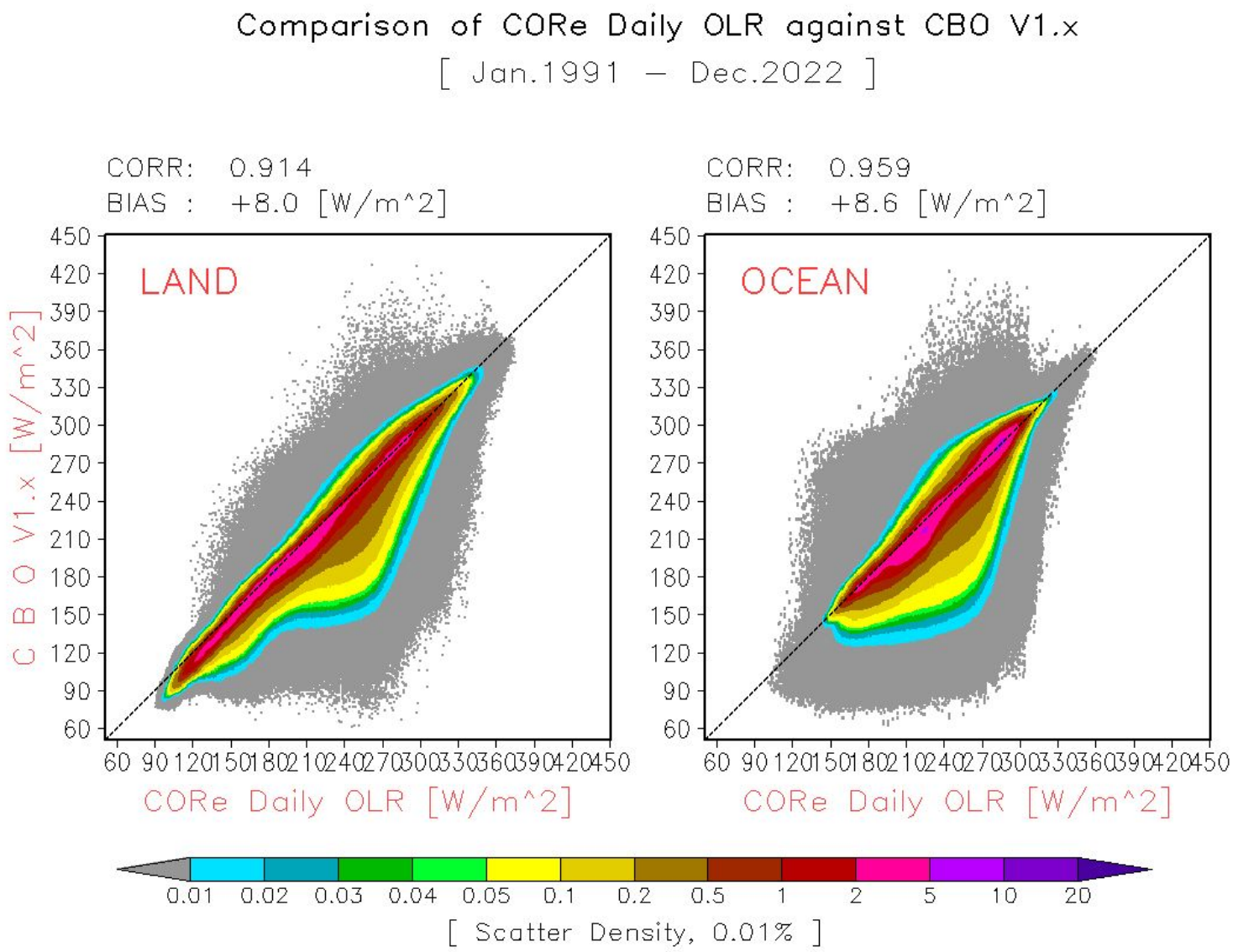
1) Time Series of Global and Tropical Monthly Mean OLR





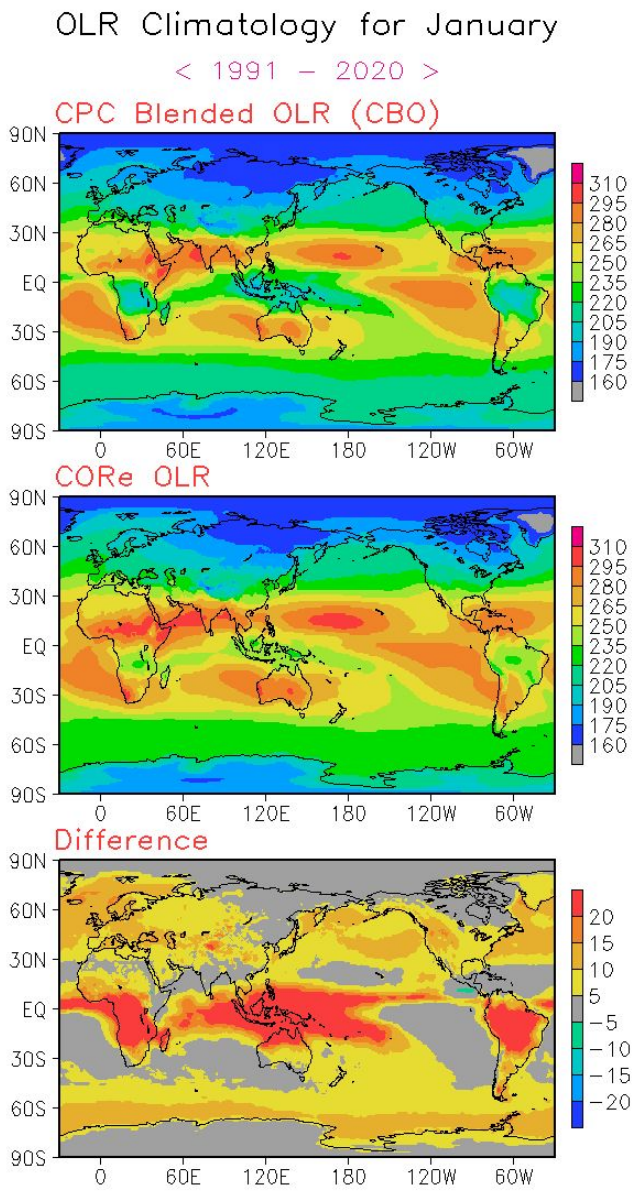
Total OLR

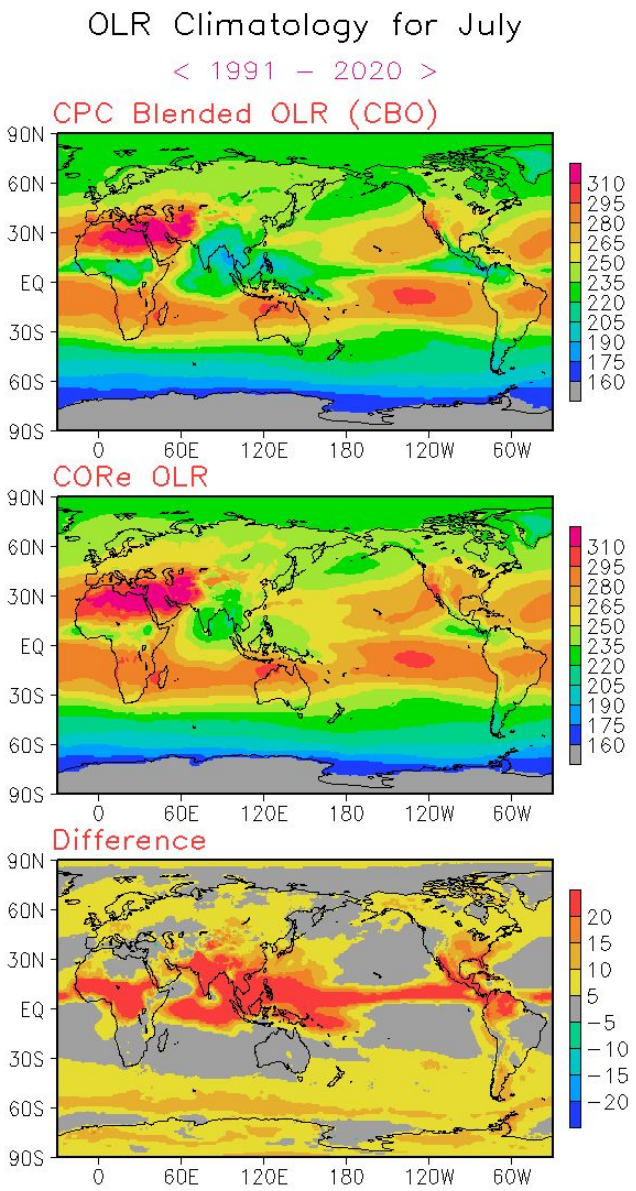
2) Scatter Density Plots of Daily Mean OLR



Climatology

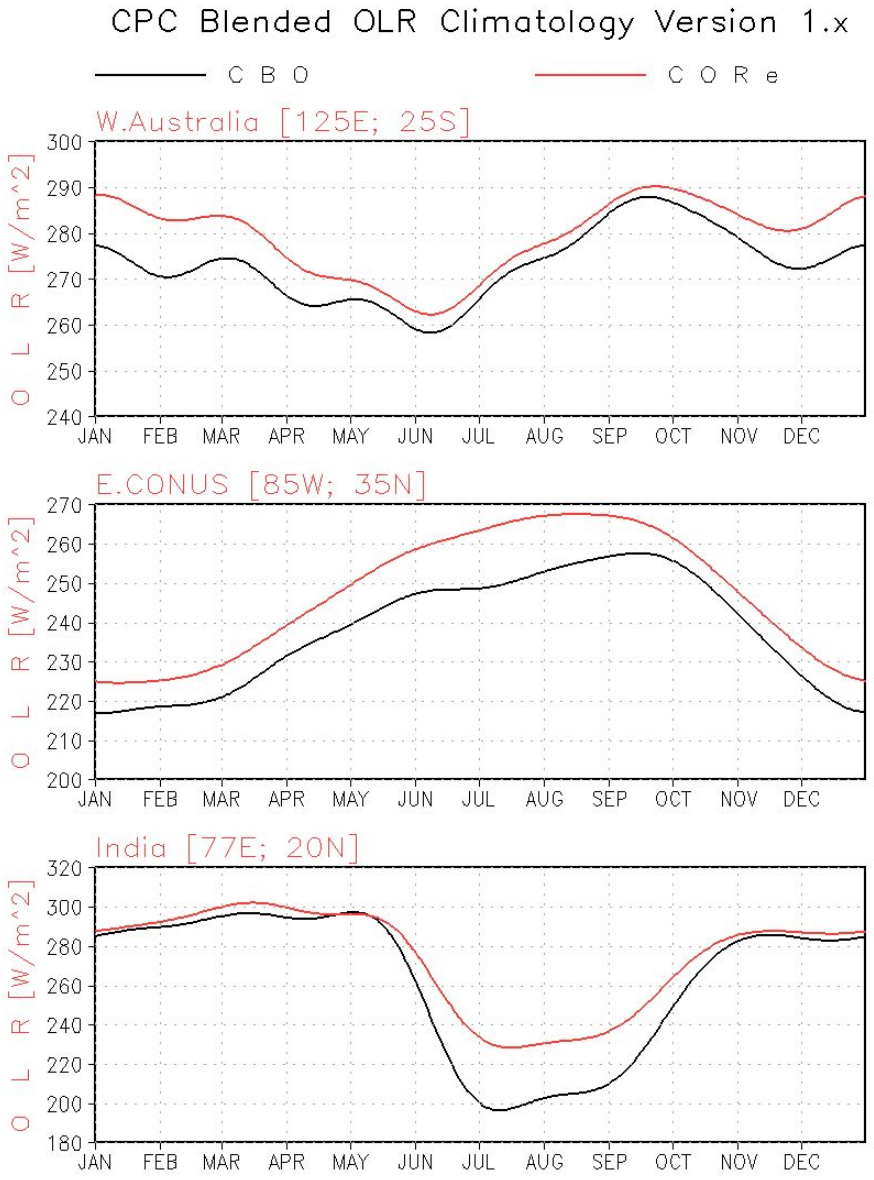
1) Monthly Climatology

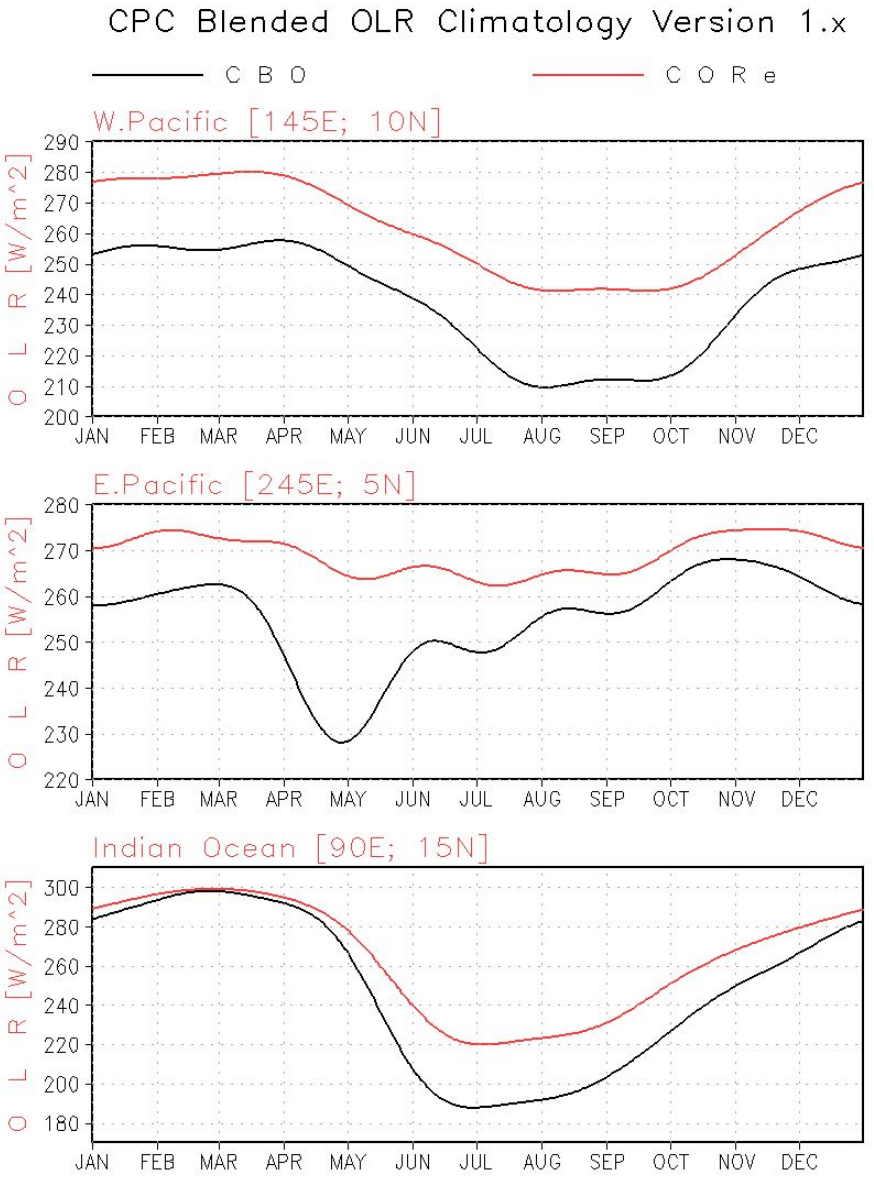




Climatology

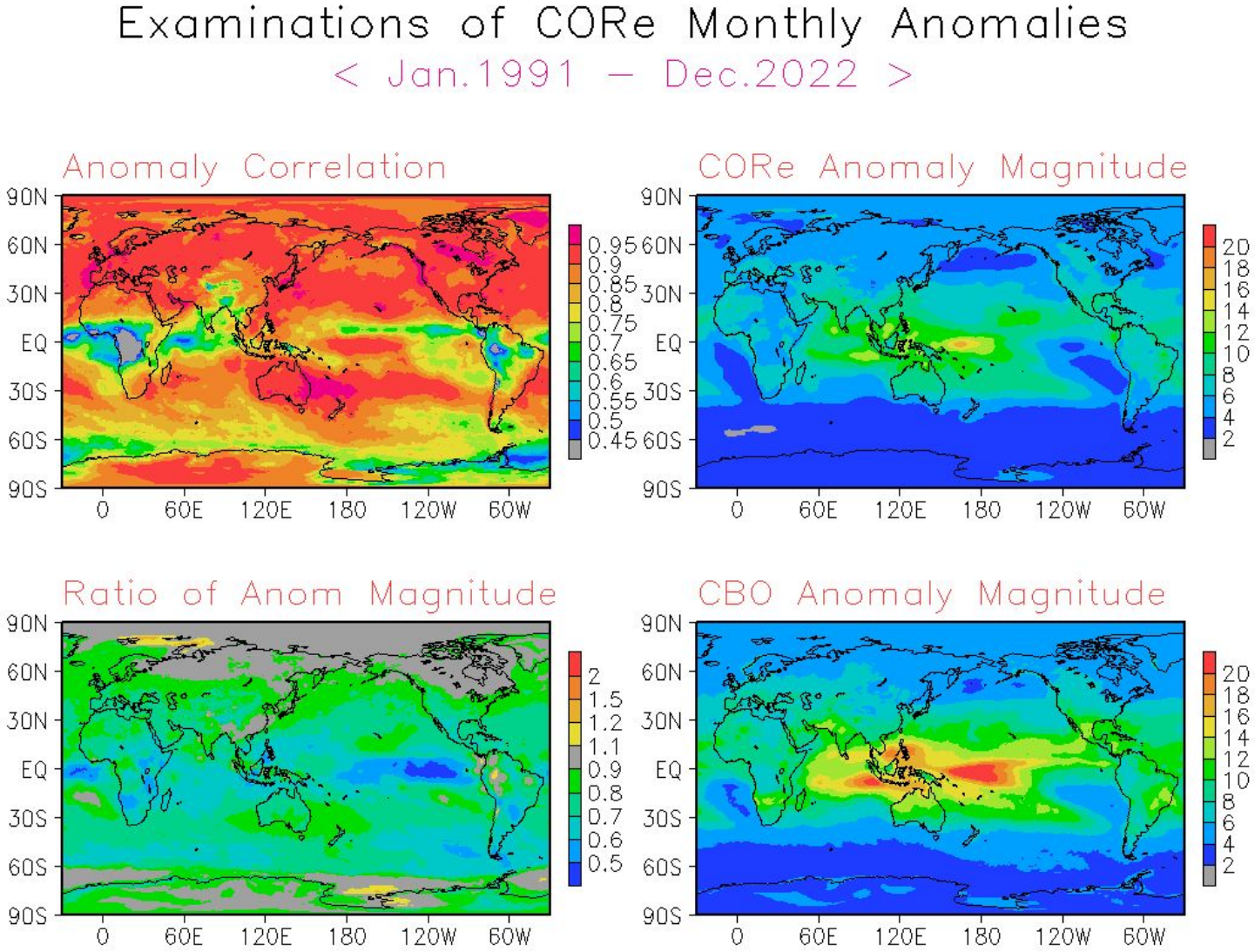
2) Seasonal Evolution in Daily Climatology





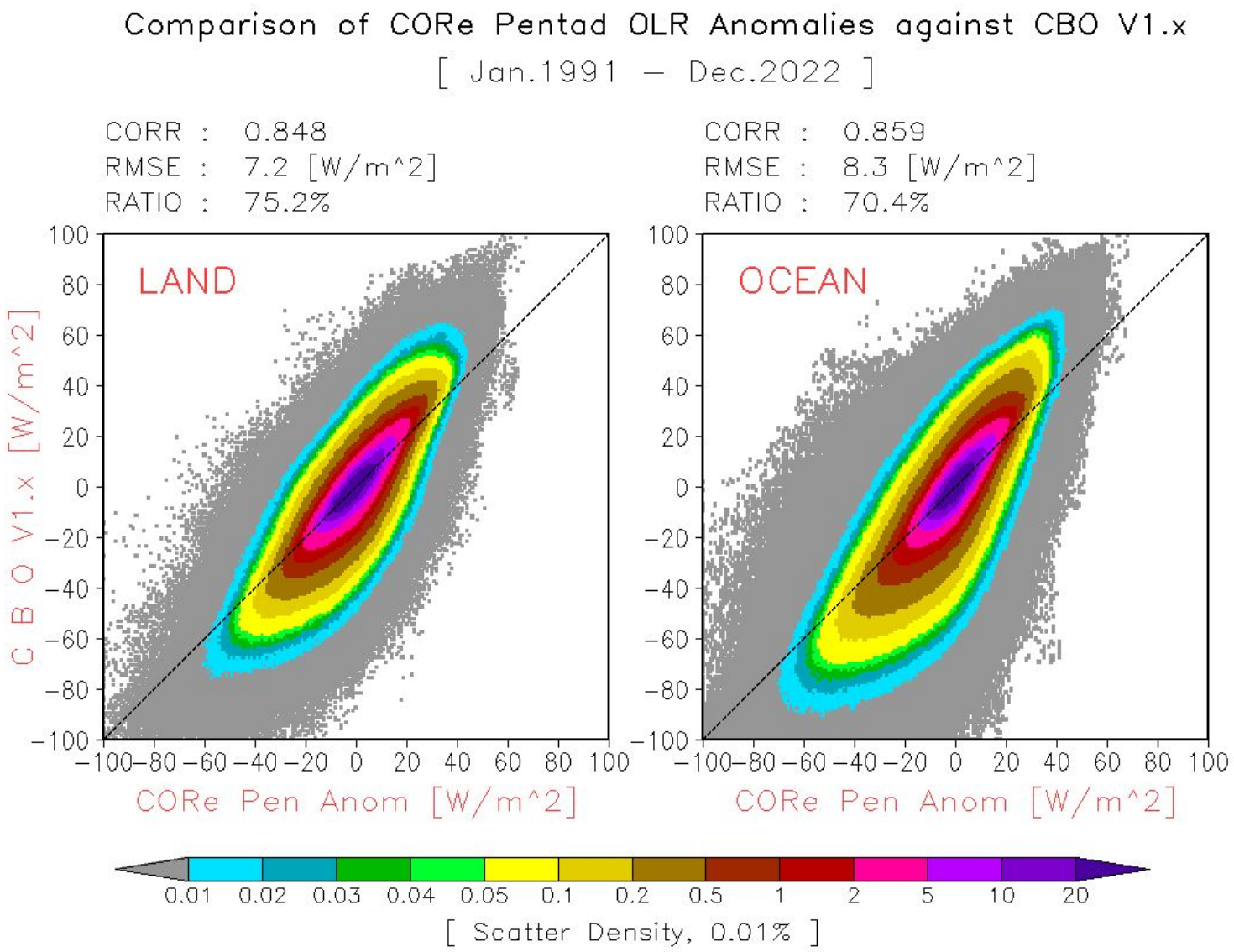
Anomalies

1) Comparison Statistics for Monthly Anomalies



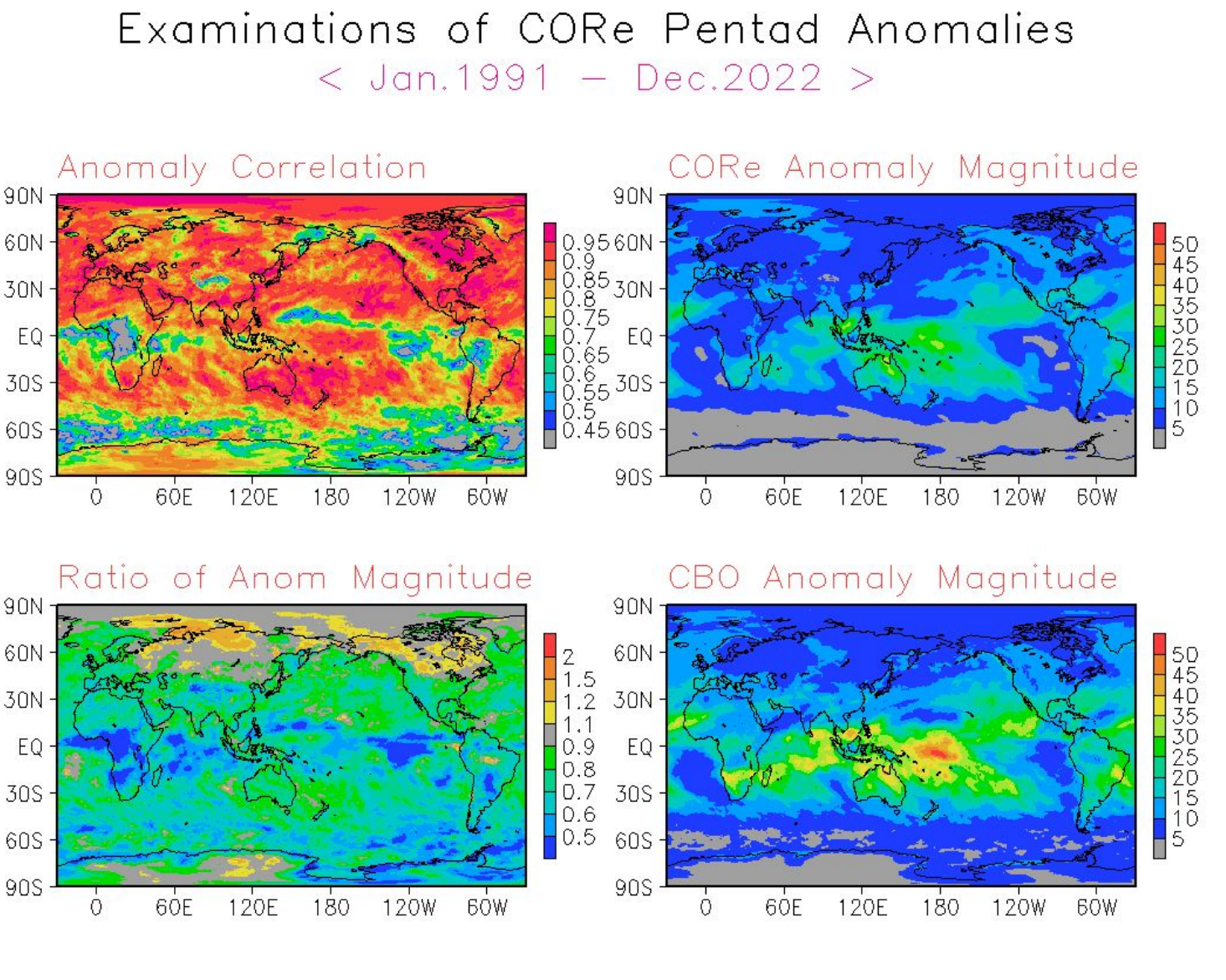
Anomalies

2) Scatter Density Plots of Monthly Anomalies



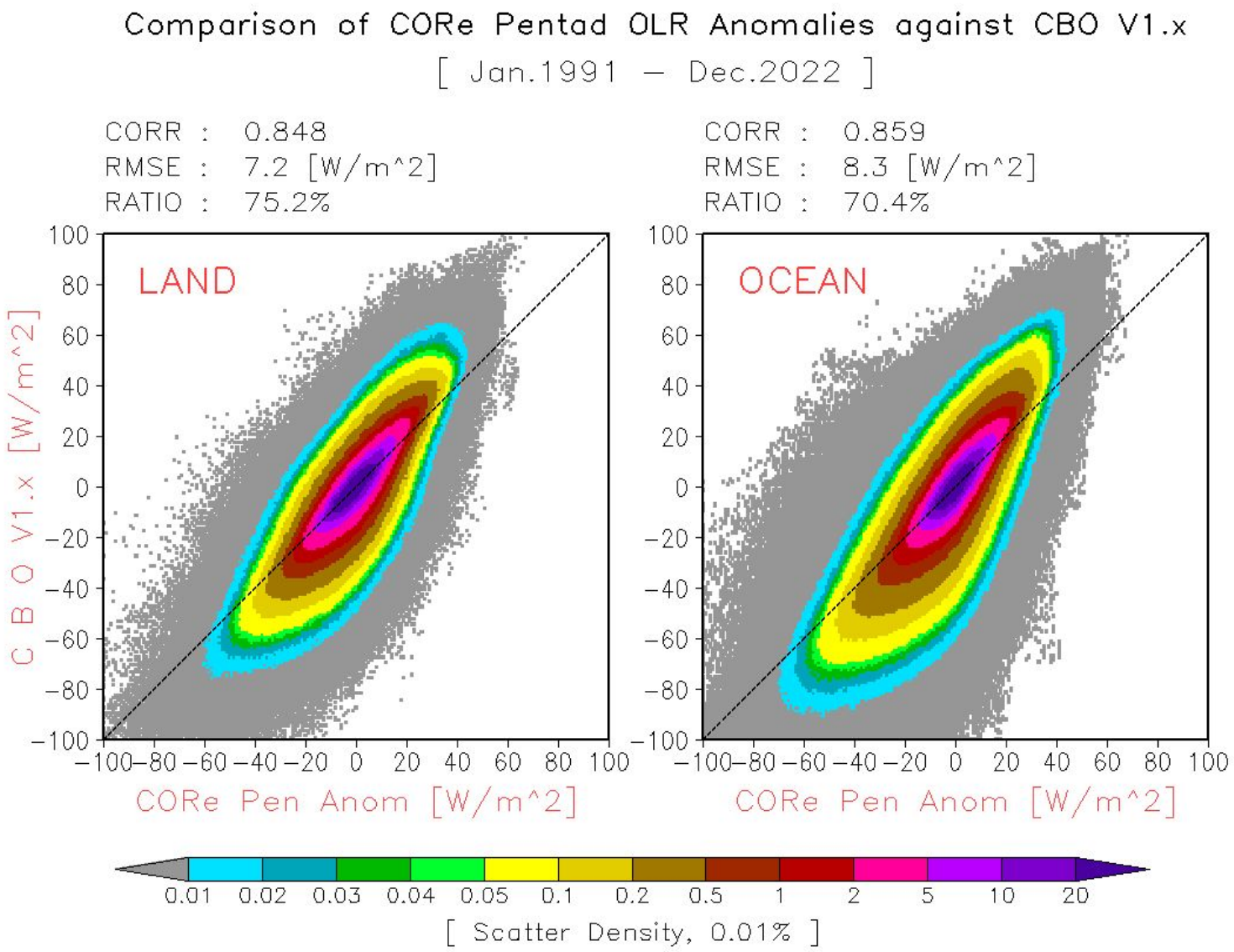
Anomalies

3) Comparison Statistics for Pentad Anomalies



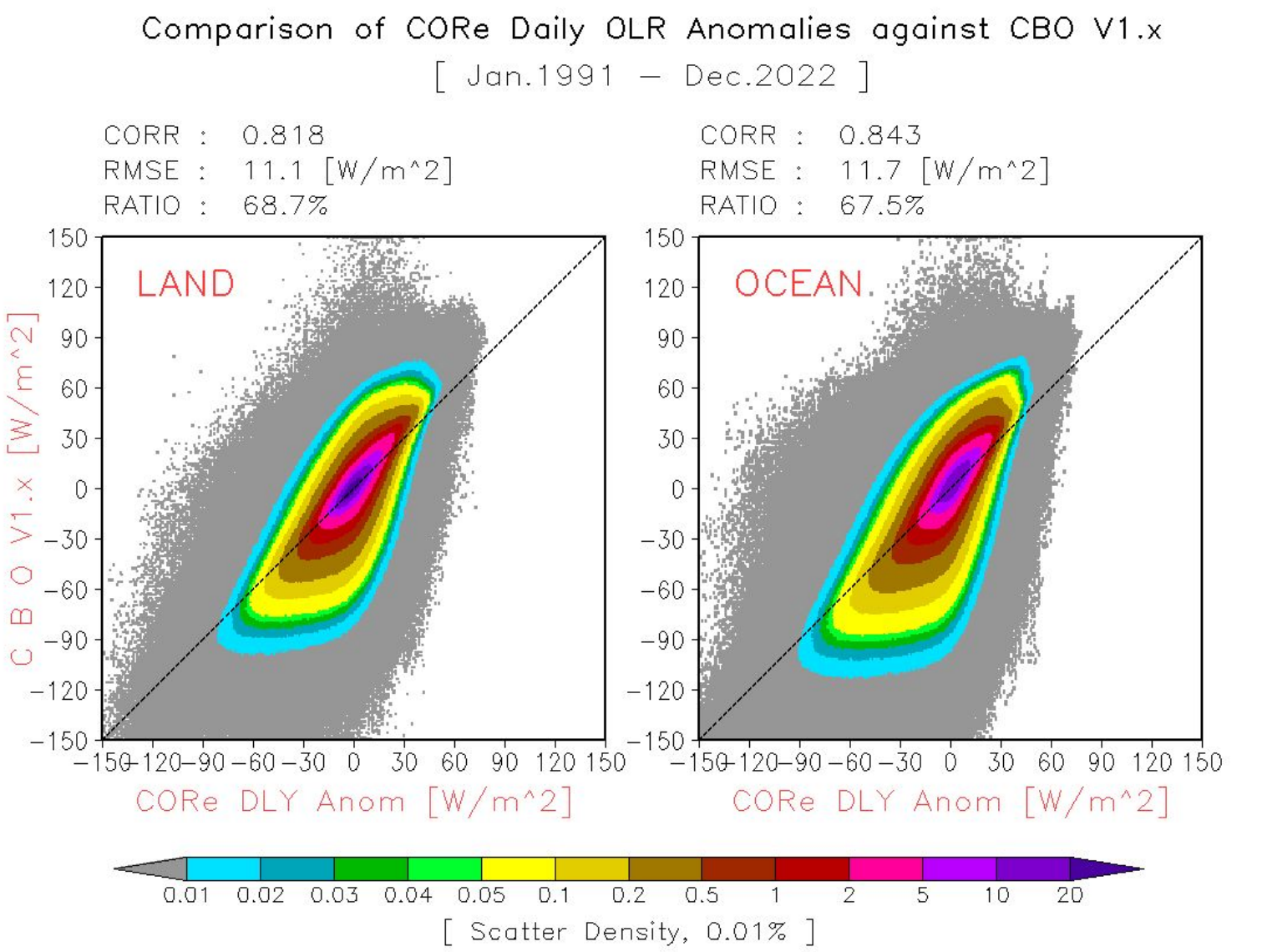
Anomalies

4) Scatter Density Plots of Pentad Anomalies



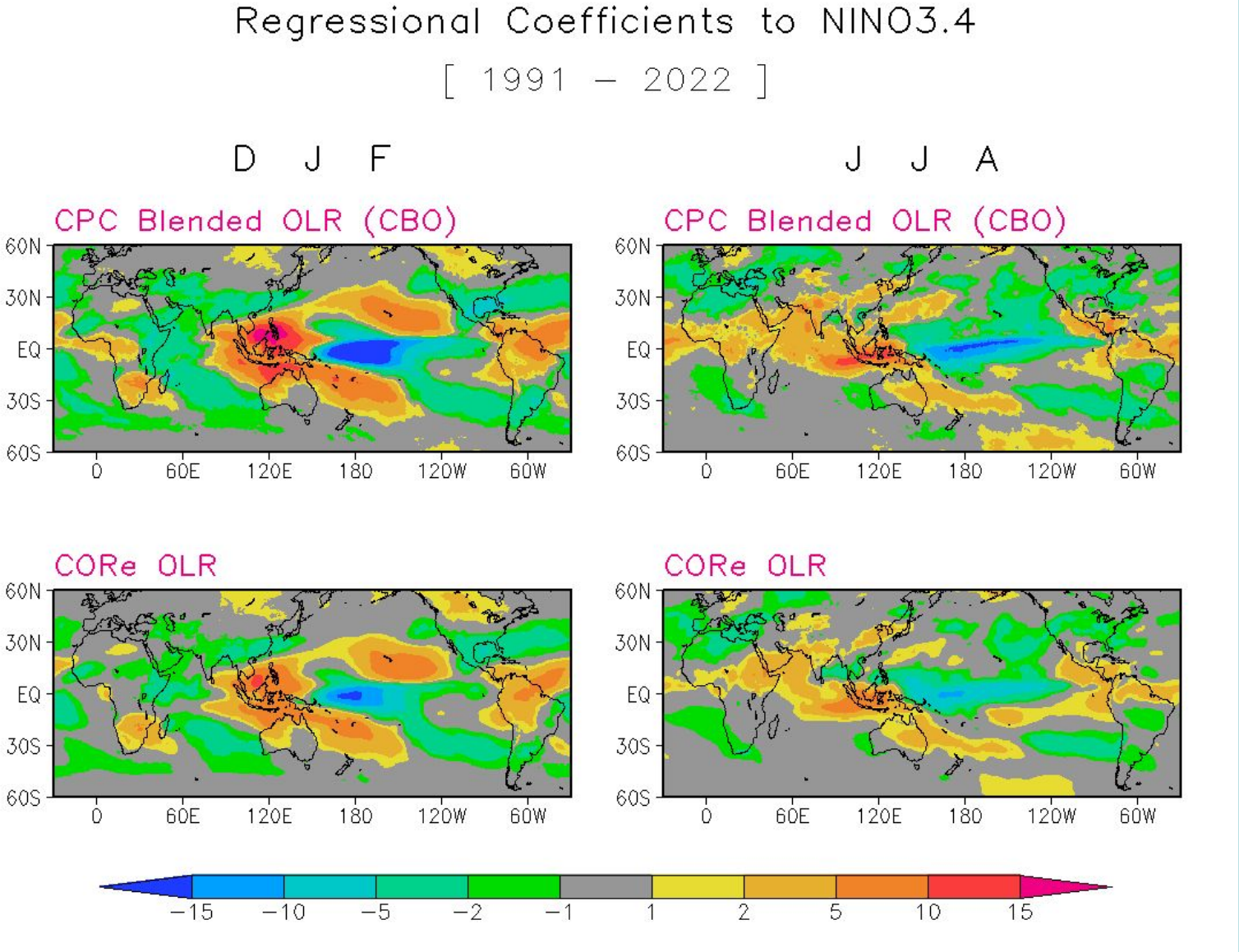
Anomalies

5) Scatter Density Plots of Daily Anomalies



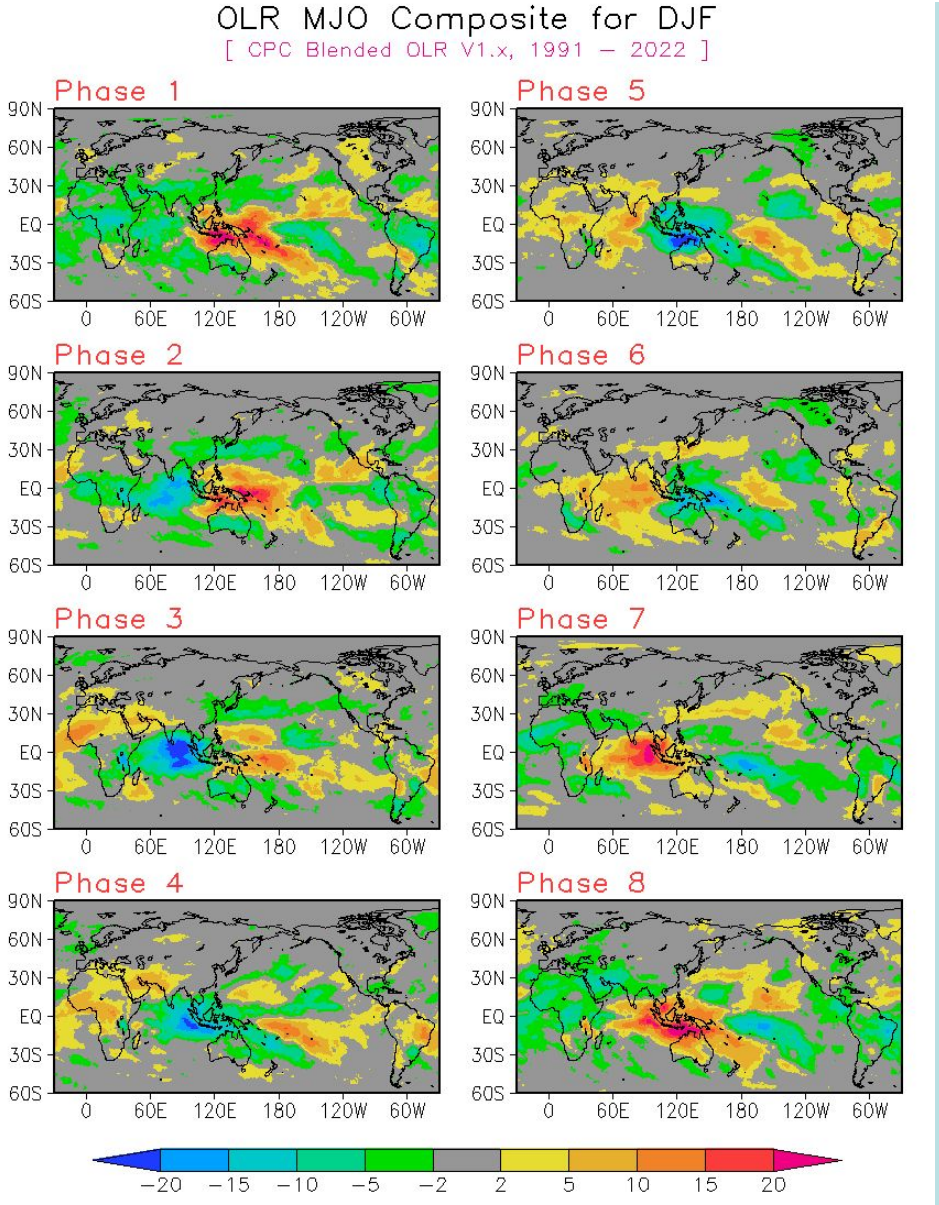
Variability

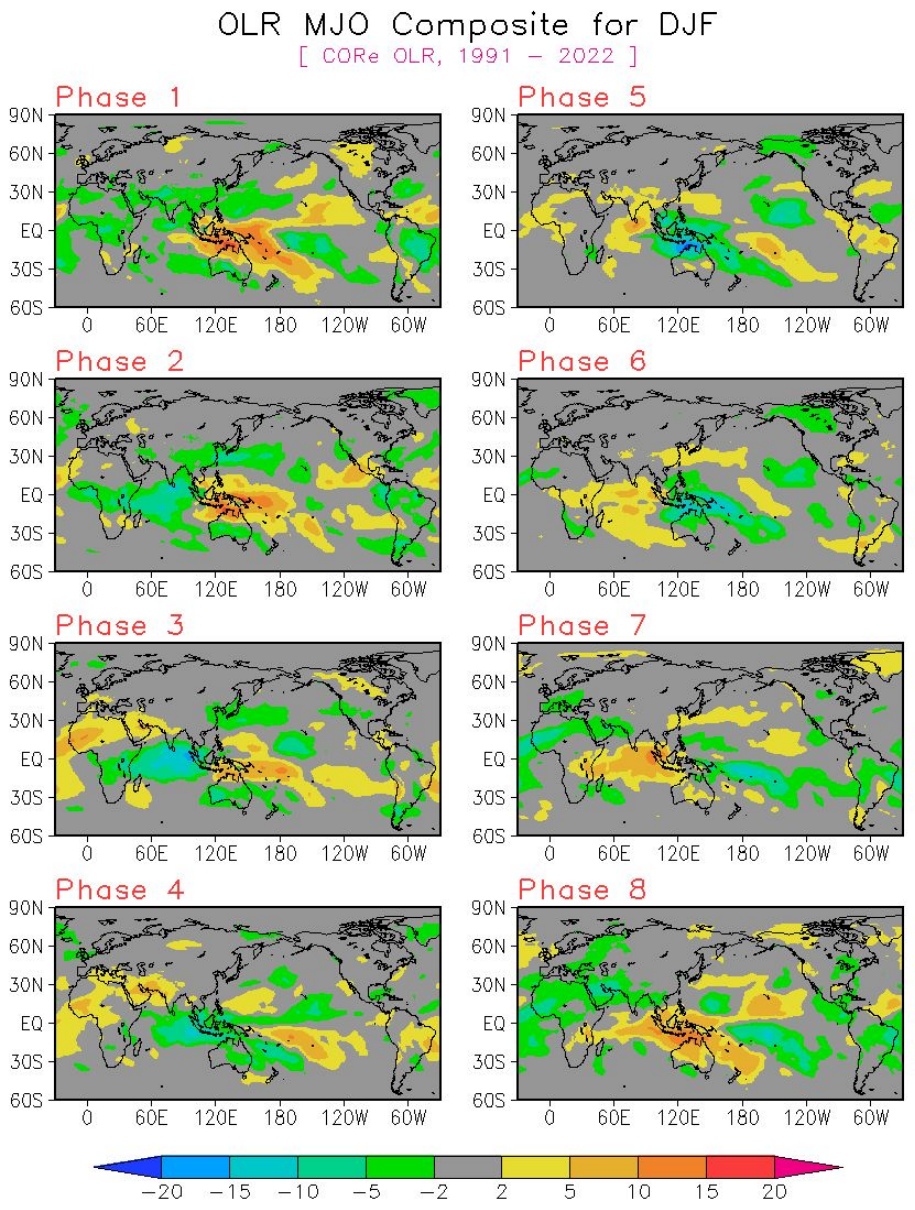
1) ENSO



Variability

2) *MJO*





Summary

- Overall, OLR in the CORe agrees quite well with that in the observations (CPC Blended OLR, CBO);
- The total OLR in the CORe is warmer than that in CBO, ~8W/m^2 in the global mean and ~20W/m^2 in the tropical mean;
- Seasonal evolution of OLR in the CBO is well captured by the CORe though the magnitude is under-estimated;
- OLR anomalies are also represented quite well, except over the tropical east Pacific an Africa where anomaly correlation is not high;
- OLR variations associated with ENSO and MJO are also depicted very well, though the magnitude is weaker than that in the observations;