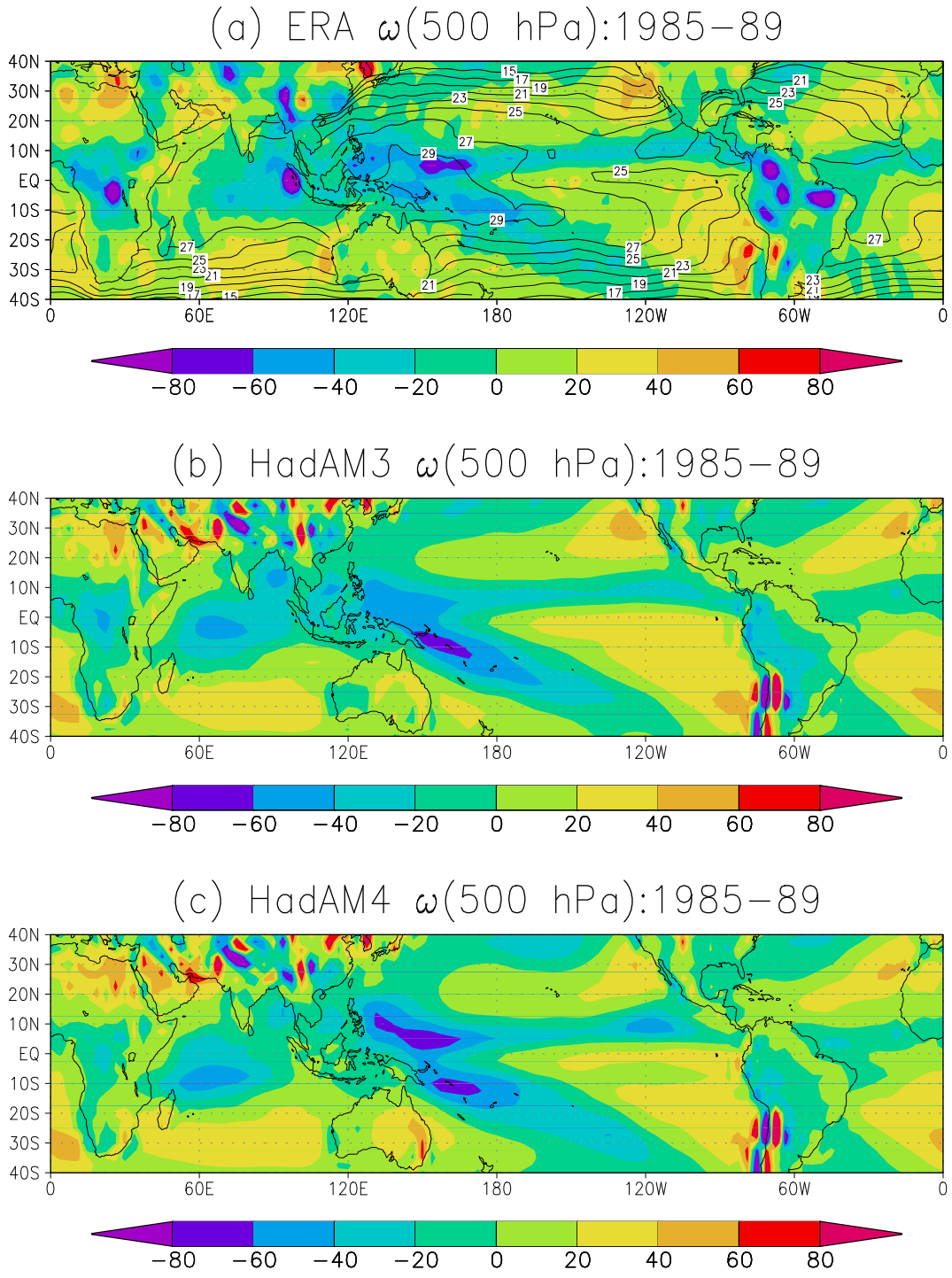

Figure 1: Mean 500 hPa vertical velocity (hPa day^{-1}) from (a) ERA, (b) HadAM3 and (c) HadAM4 for January 1985-December 1989.

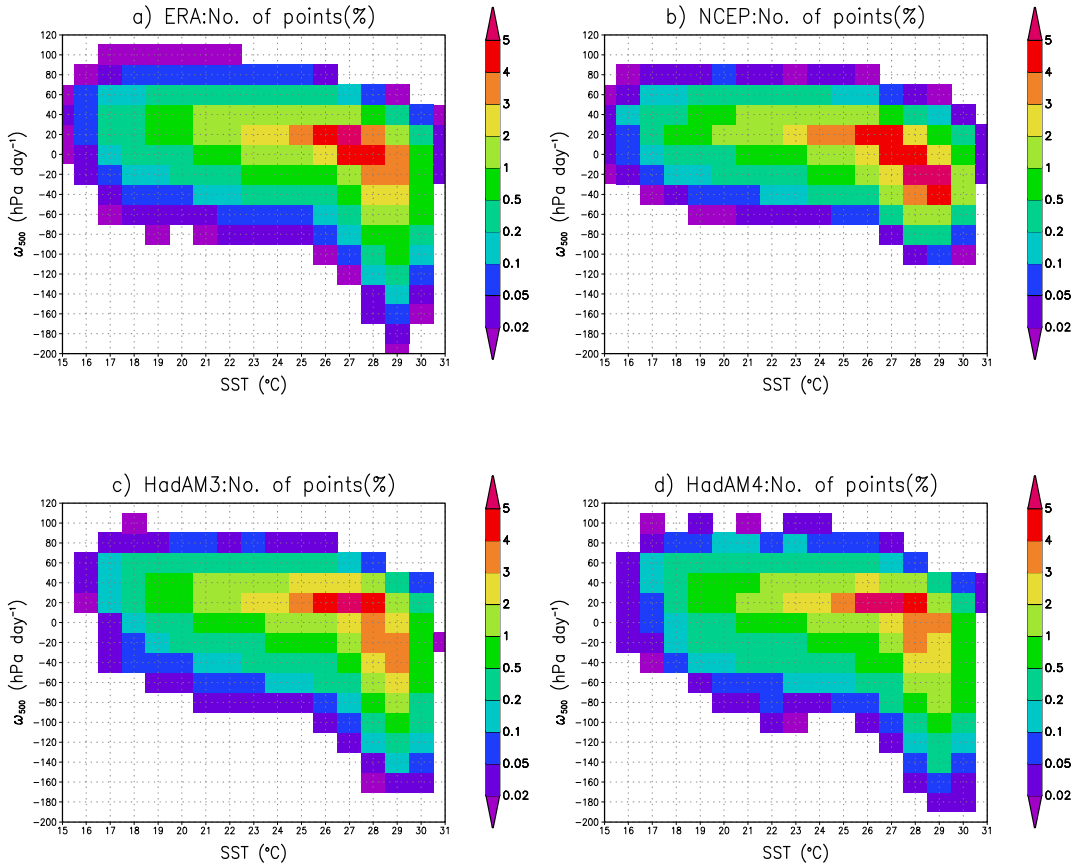

Figure 2: Populations of dynamical regimes for (a) ERA, (b) NCEP, (c) HadAM3 and (d) HadAM4.

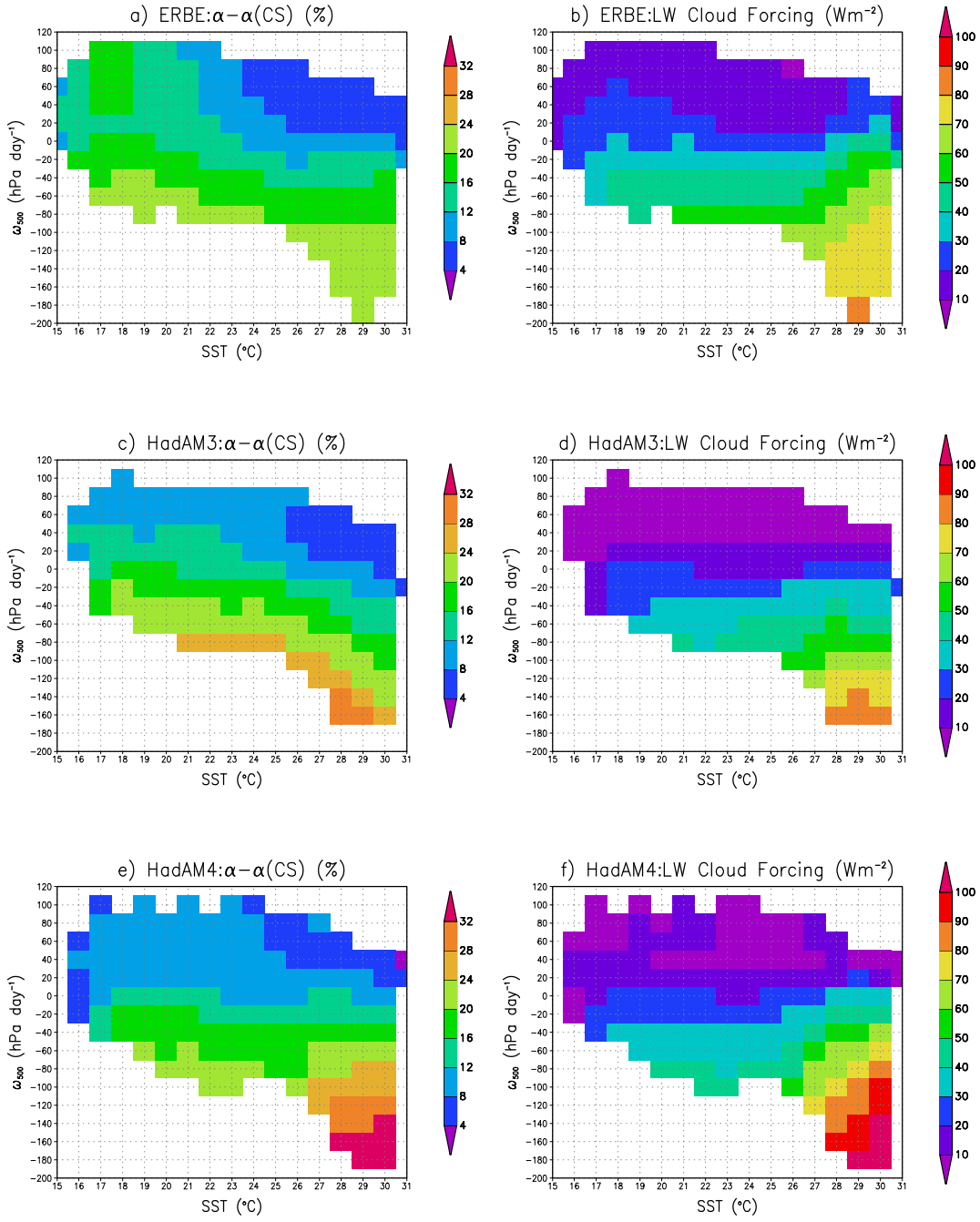

Figure 3: Cloud albedo perturbation and longwave cloud forcing as a function of dynamical region derived from satellite data, HadAM3 and HadAM4.

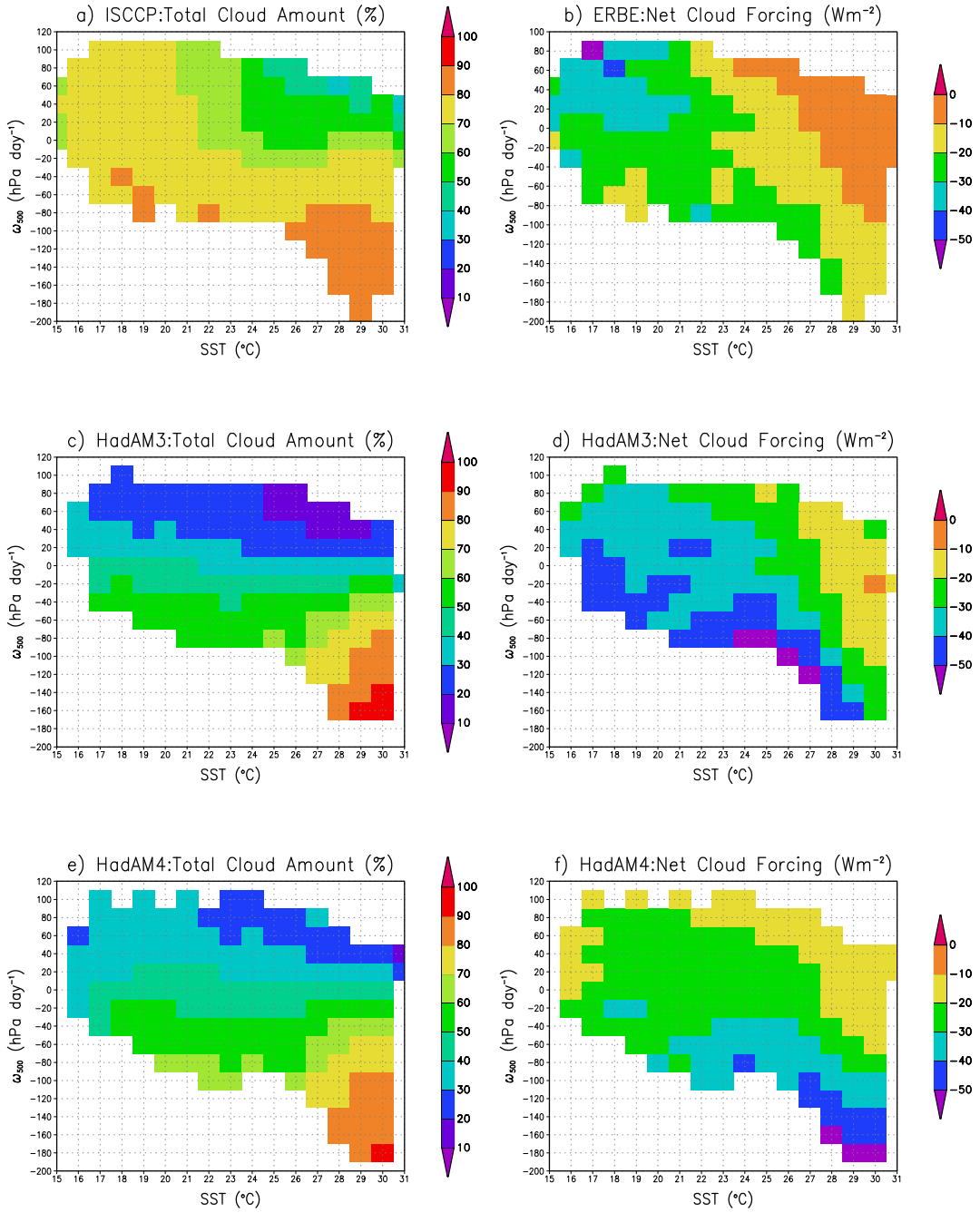

Figure 4: As Fig. 3 but for total cloud amount and net cloud forcing.

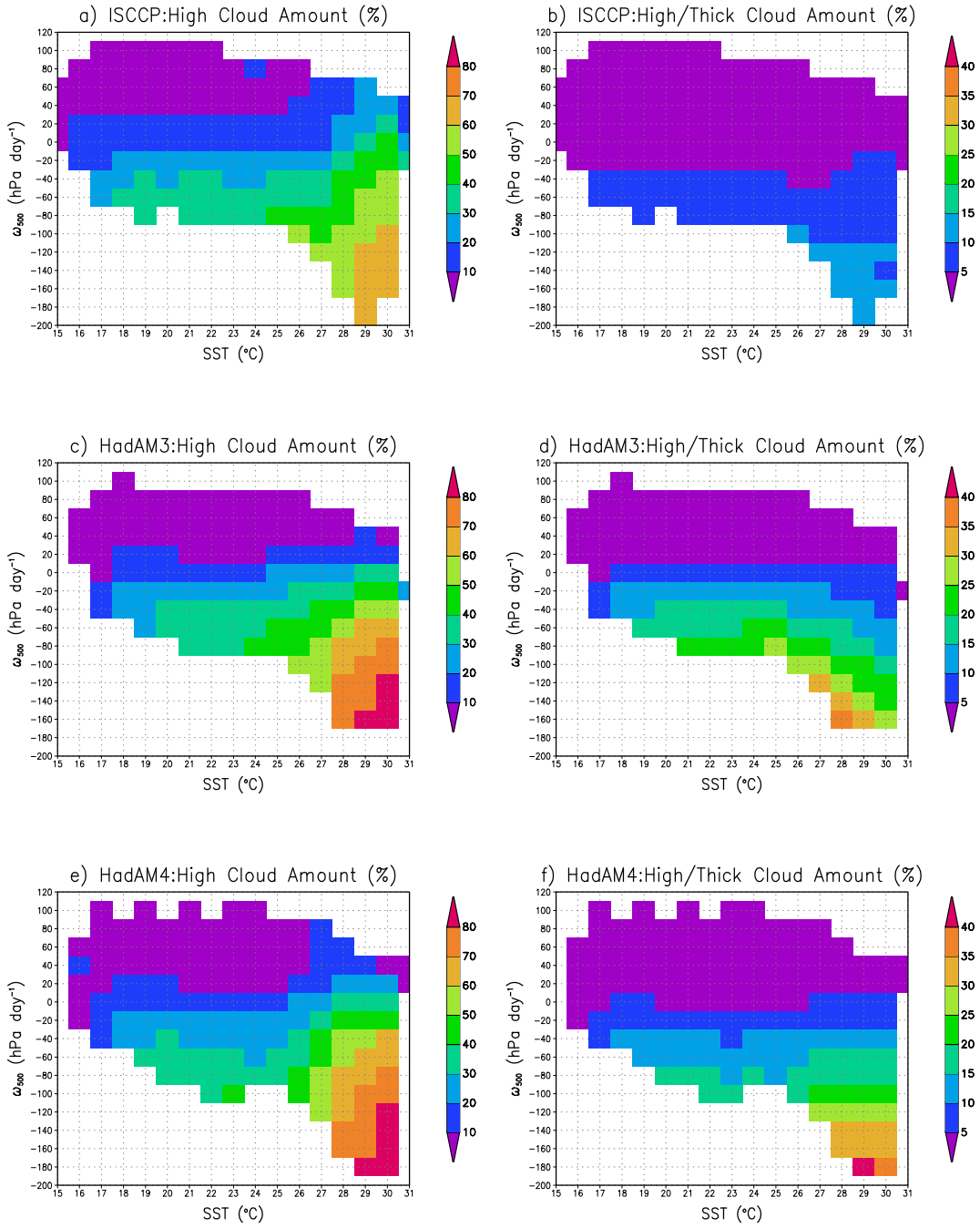

Figure 5: As Fig. 3 but for high cloud amount and high/thick cloud amount.

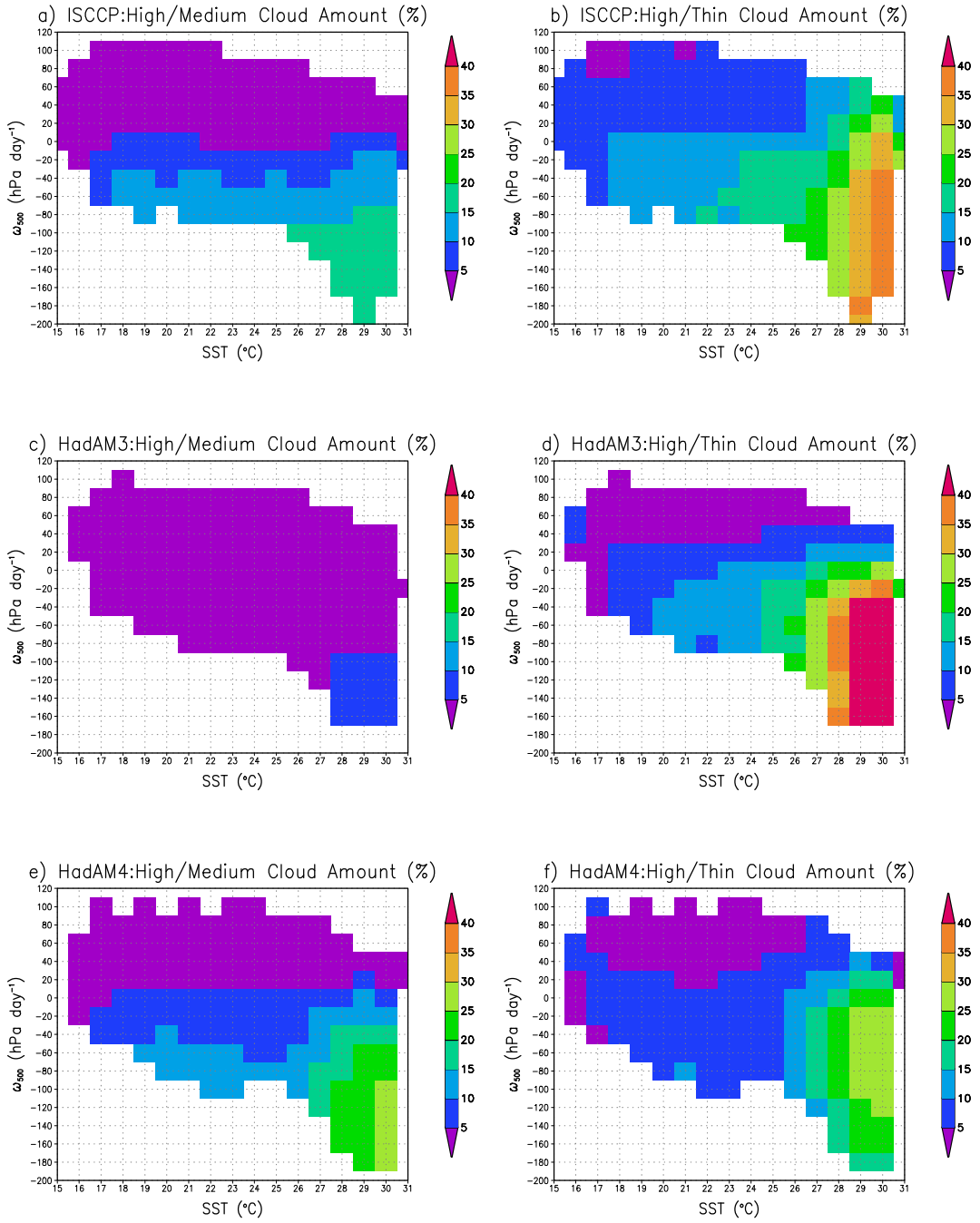

Figure 6: As Fig.3 but for high/medium optical thickness and high/thin cloud amounts.

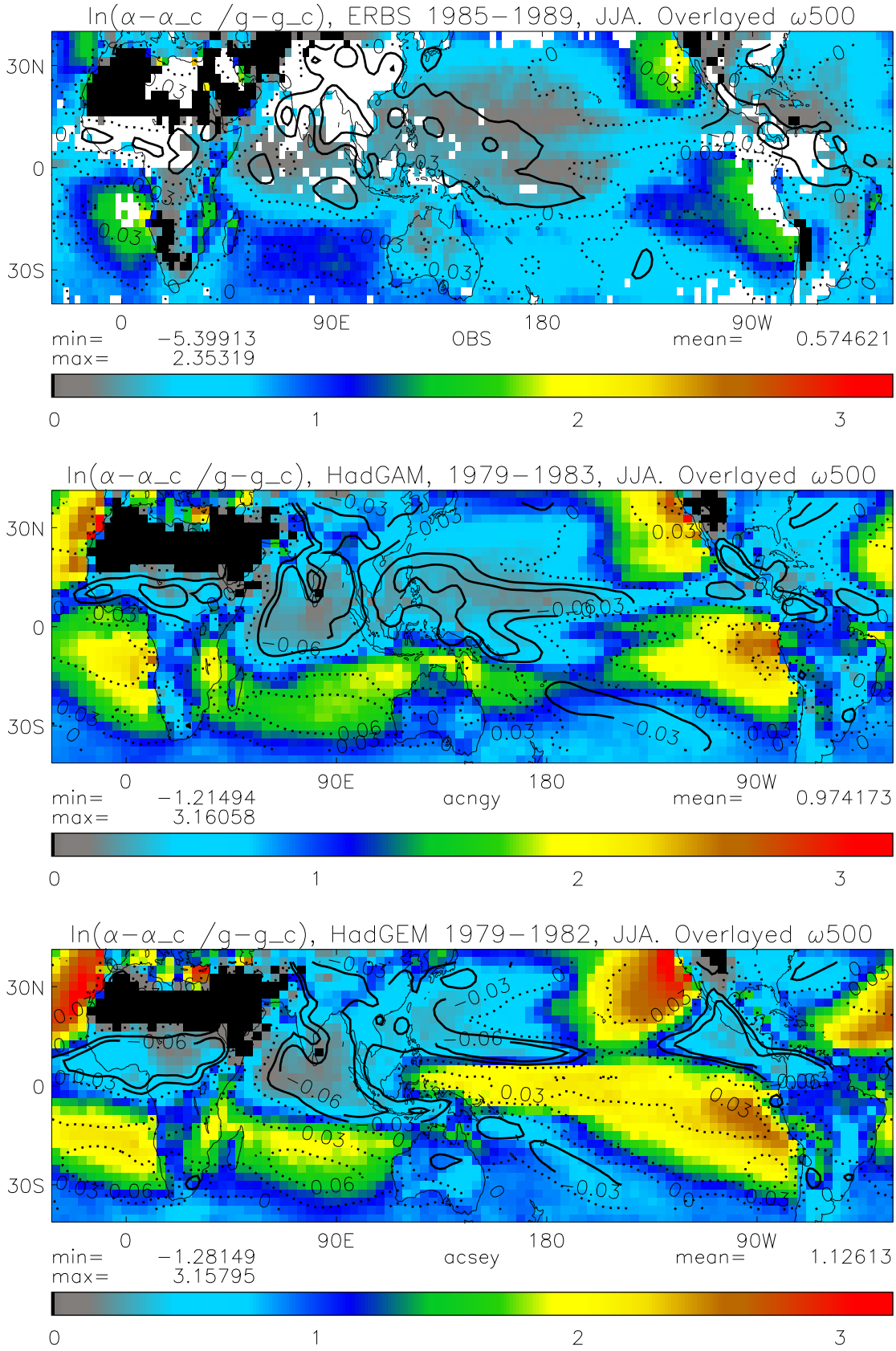

Figure 7: Modified cloud forcing ratio parameter (N') in JJA for (a) ERBS 1985-1989, (b) HadGAM 1979-1984 and (b) HadGEM 1979-1982. N' is the natural logarithm of the ratio of the albedo effect of cloud to the greenhouse trapping of cloud.

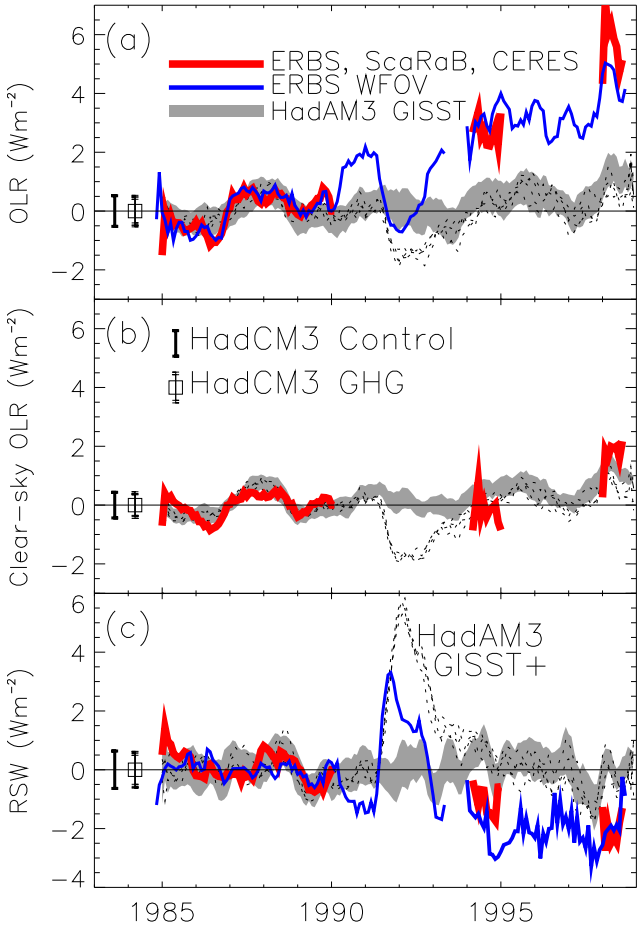

Figure 8: Time series of the 40°S-40°N top-of-atmosphere interannual radiative flux anomaly (Wm^{-2}) for (a) OLR, (b) clear-sky OLR and (c) RSW. Error bars denote +-1 standard deviation of the variability from HadCM3 unforced and greenhouse gas (GHG) forced runs. Shaded area denotes HadAM3 ensemble forced with observed SST/sea-ice (GISST) while dotted lines denote the HadAM3 all-forcings ensemble (GISST+). The observations are shown in colour: ERBS WFOV is blue and the thick red lines denote the ERBS, ScaRaB and CERES scanner instruments. All anomalies are calculated with respect to the 1985-1989 monthly climatology.