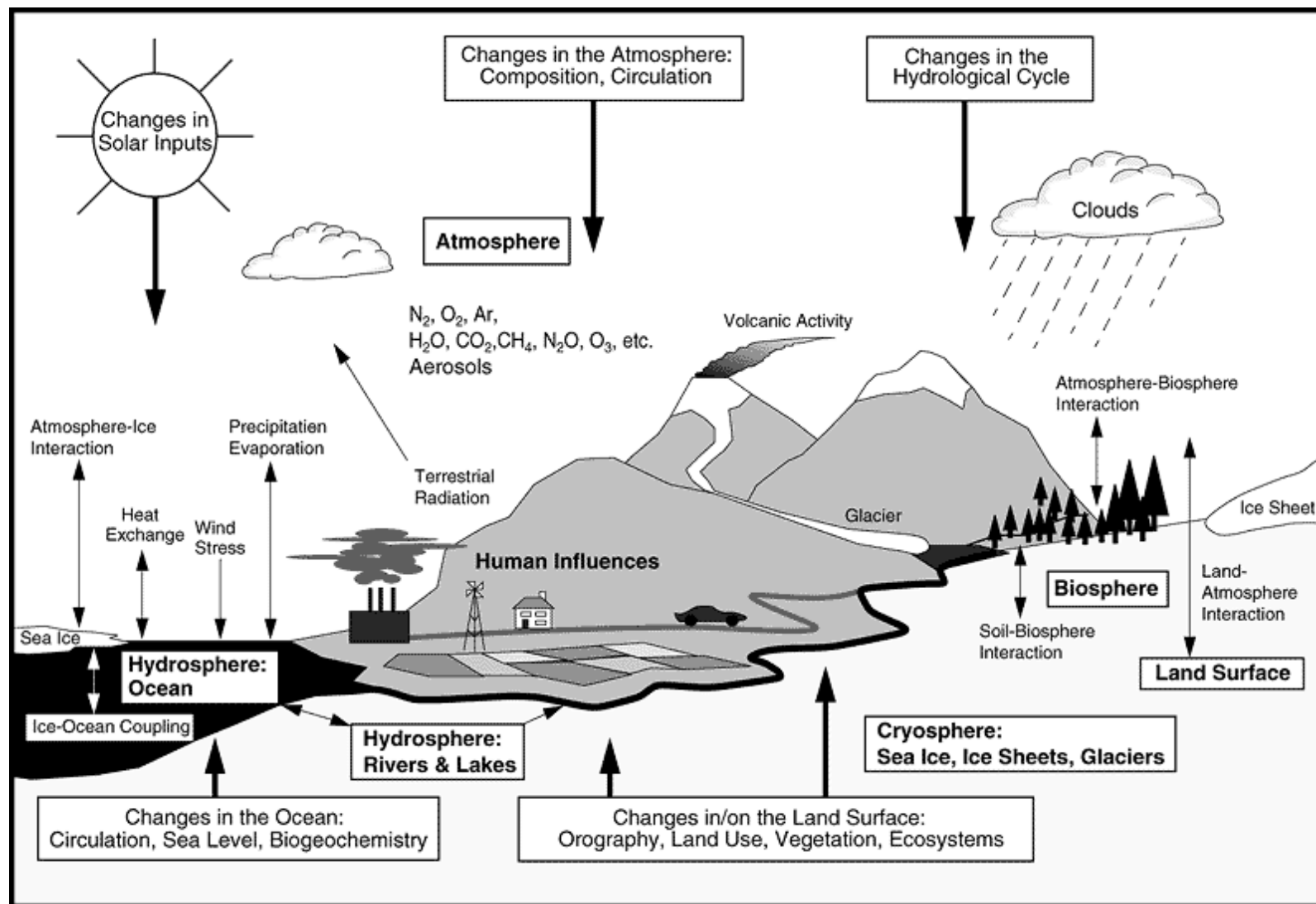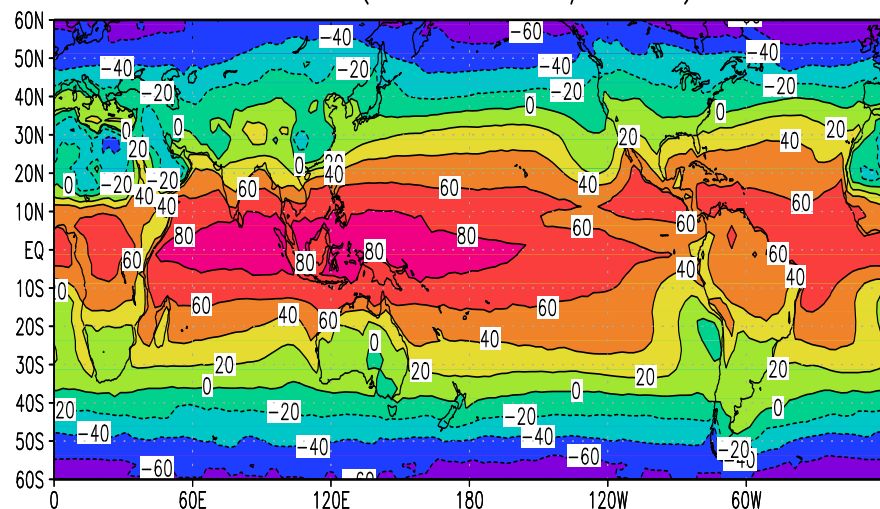Schematic showing the Earth's climate system with its five components and the interactions (thin arrows). Thick arrows indicate the possible causes of climate change.
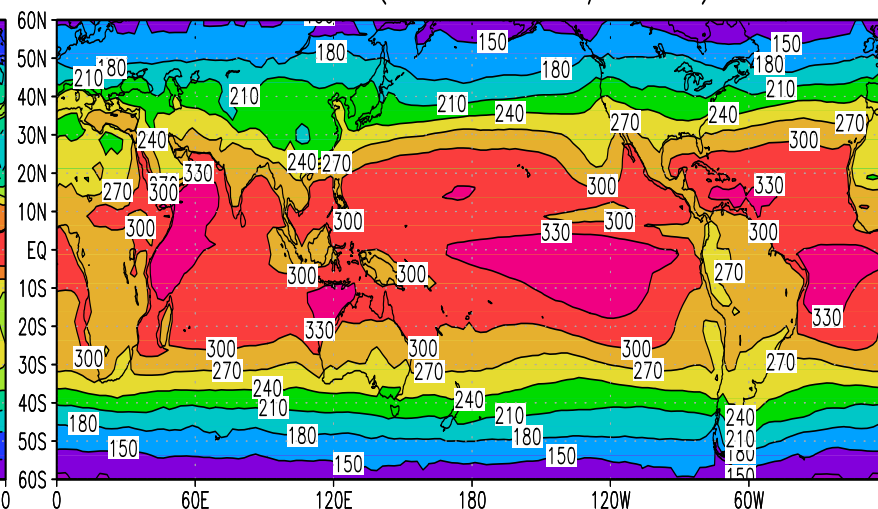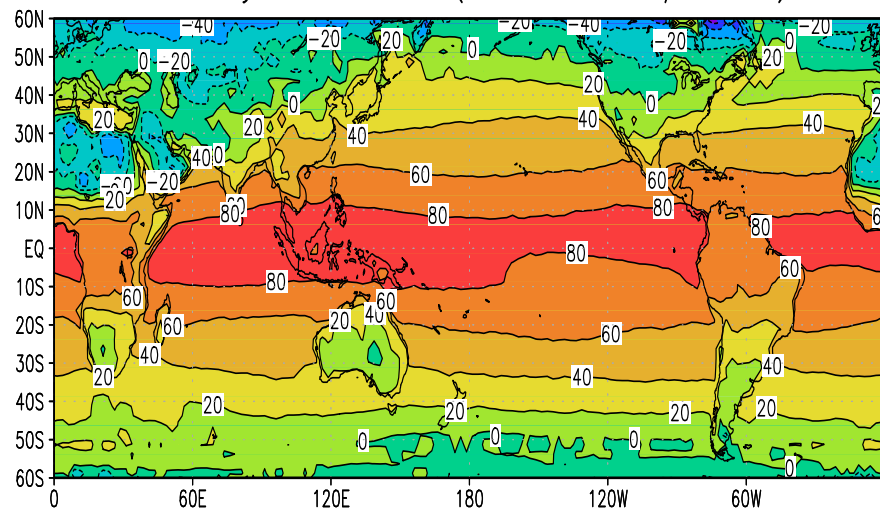
Radiative budget of the atmosphere

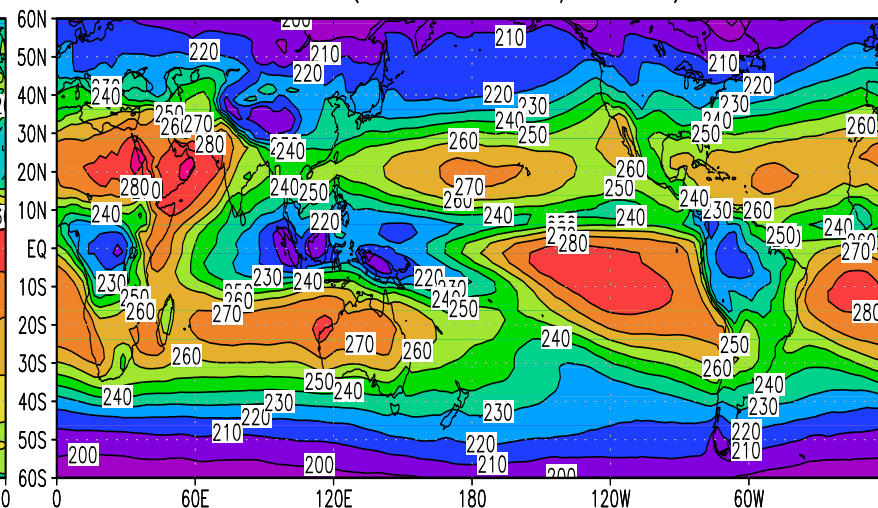## Net radiation (ERBE 1985/1990) annual

Solar radiation (ERBE 1985/1990) annual

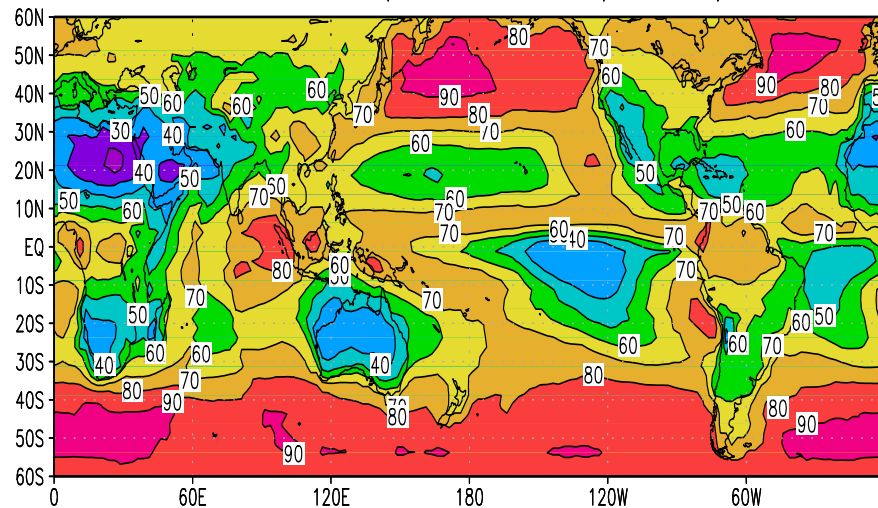## Net clear-sky radiation (ERBE 1985/1990) annual
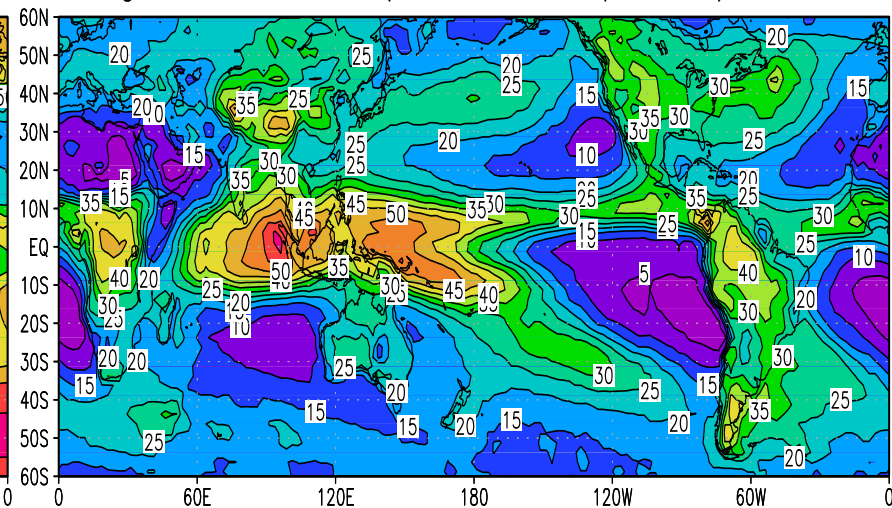

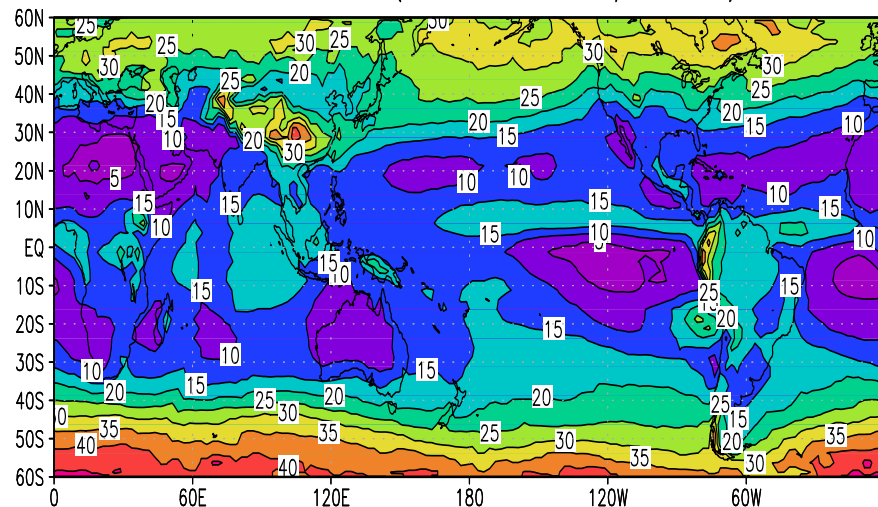## IR radiation (ERBE 1985/1990) annual

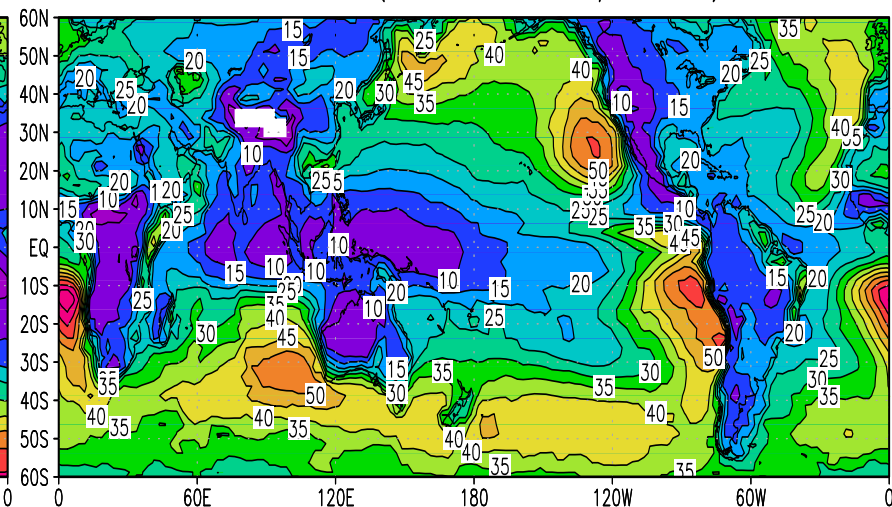# Cloud Climatology

Total cloudiness (ISCCP 1984/2003) annual

High cloudiness (ISCCP 1984/2003) annual

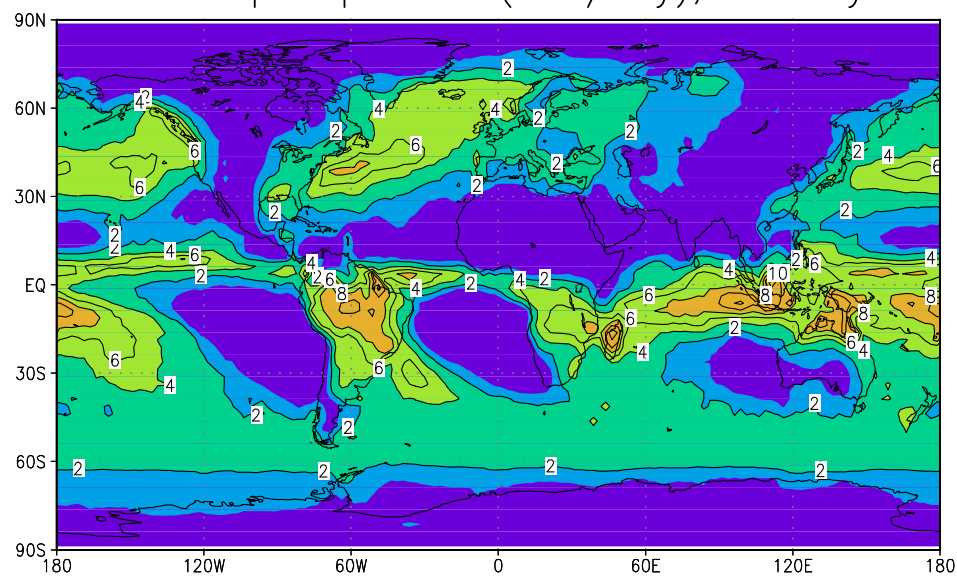### Middle cloudiness (ISCCP 1984/2003) annual

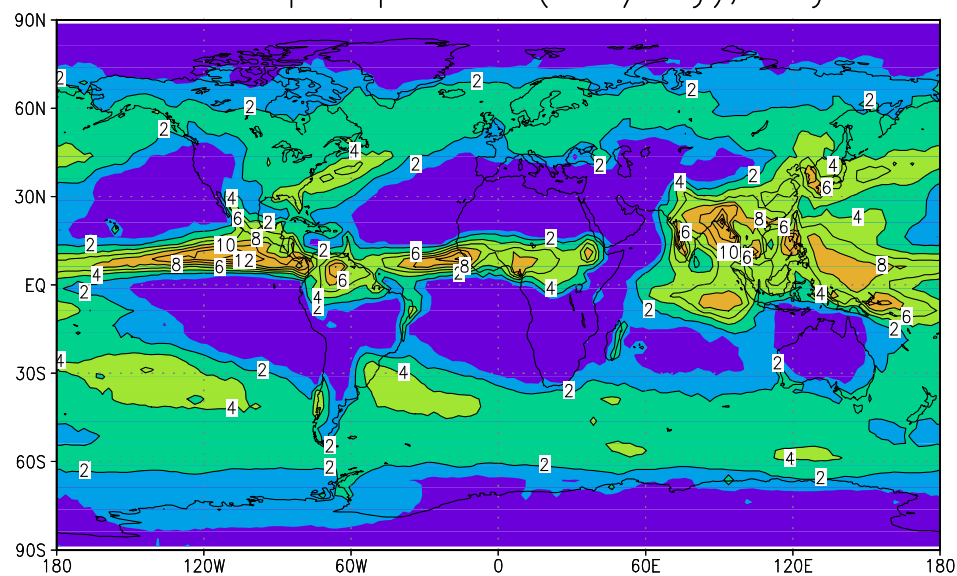### Low cloudiness (ISCCP 1984/2003) annual
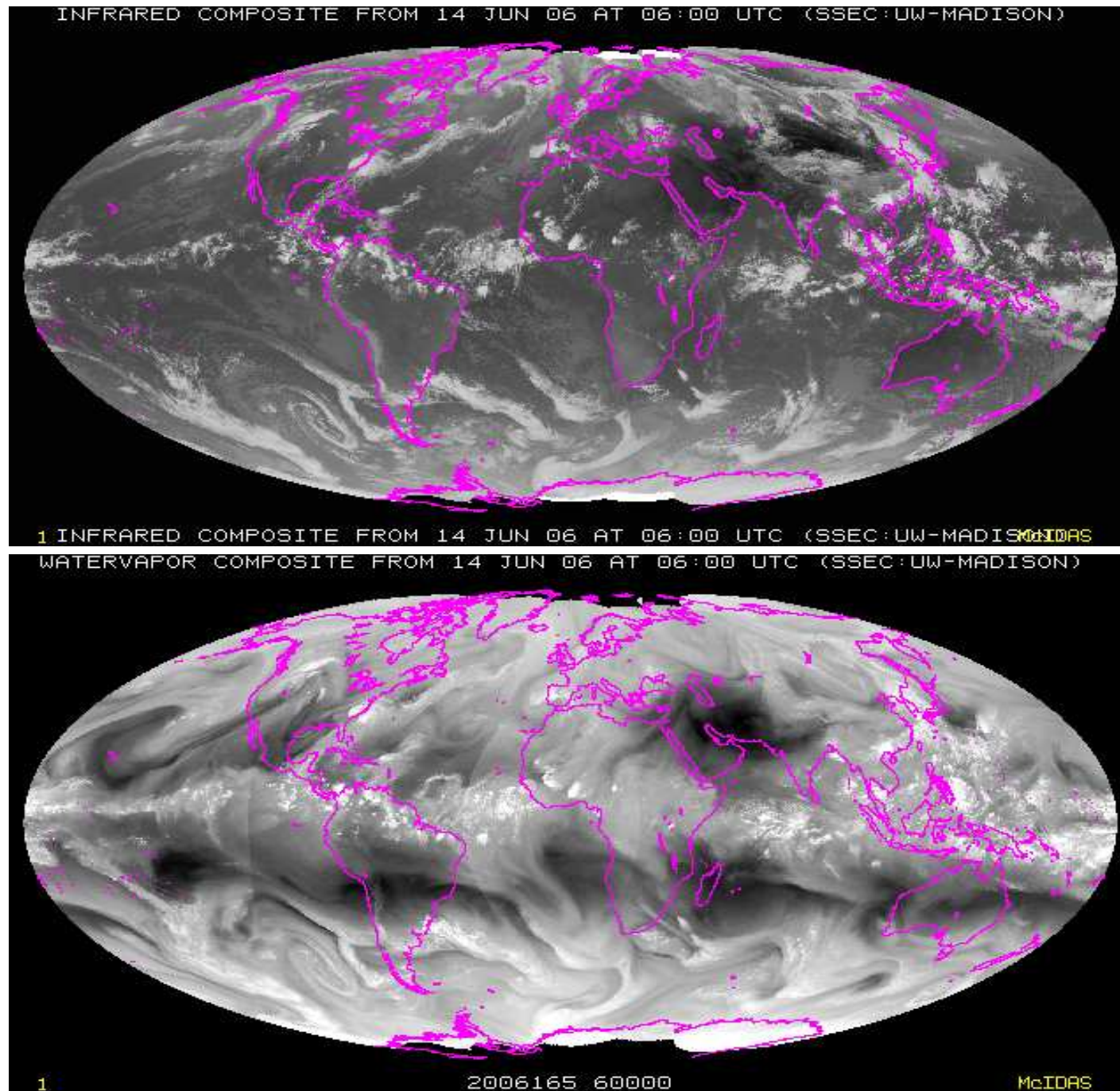
Rainfall climatology

GPCP precipitation (mm/day), January

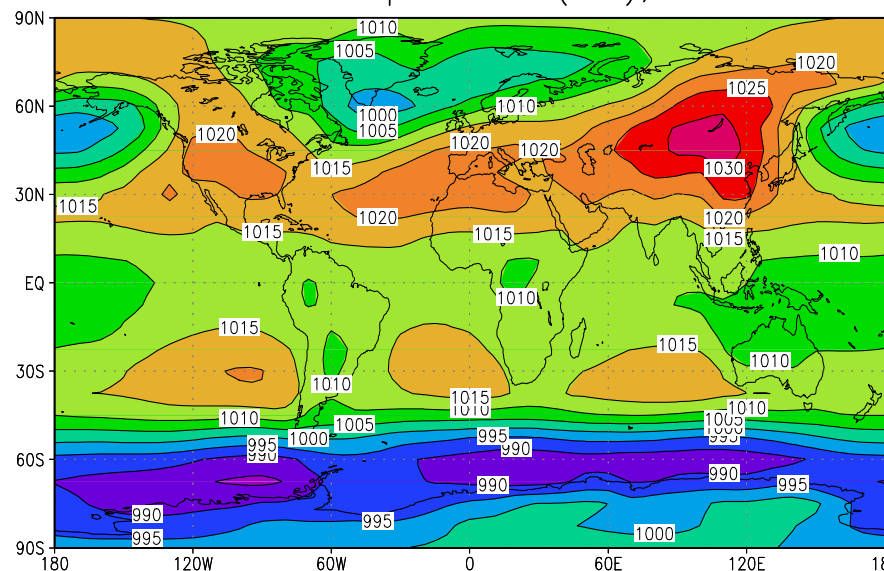
GPCP precipitation (mm/day), July

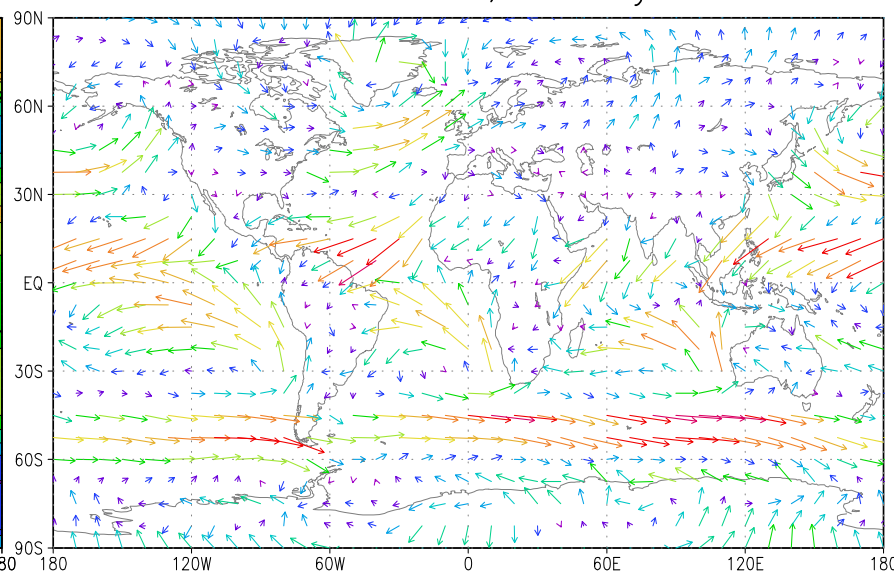## Instantaneous IR and WV images of the atmosphere
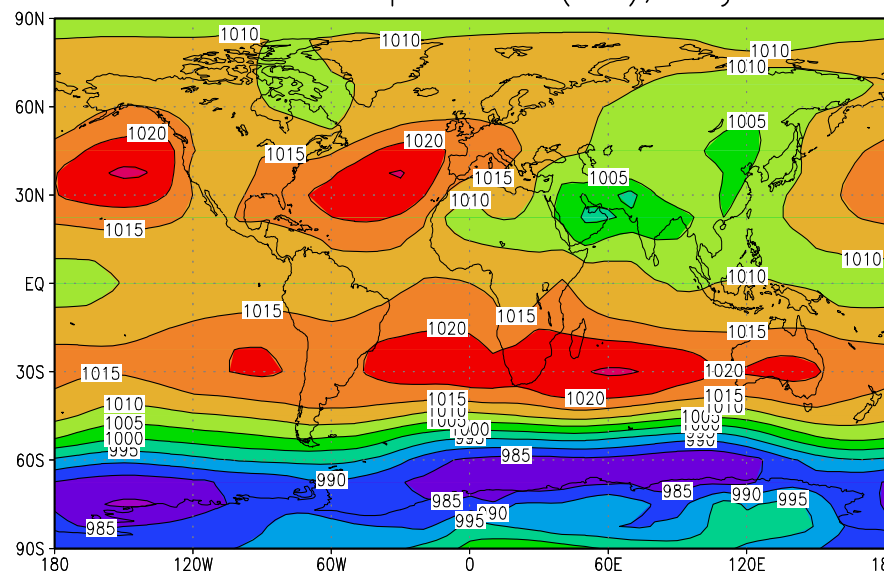
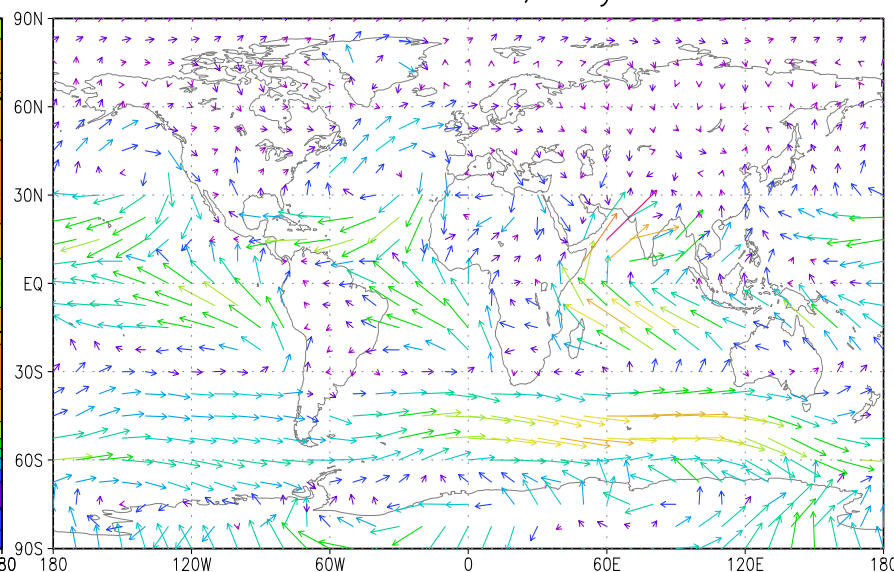# Climatology of the atmosphere

Sea-level pressure (mb), Jan.

10-m wind, January
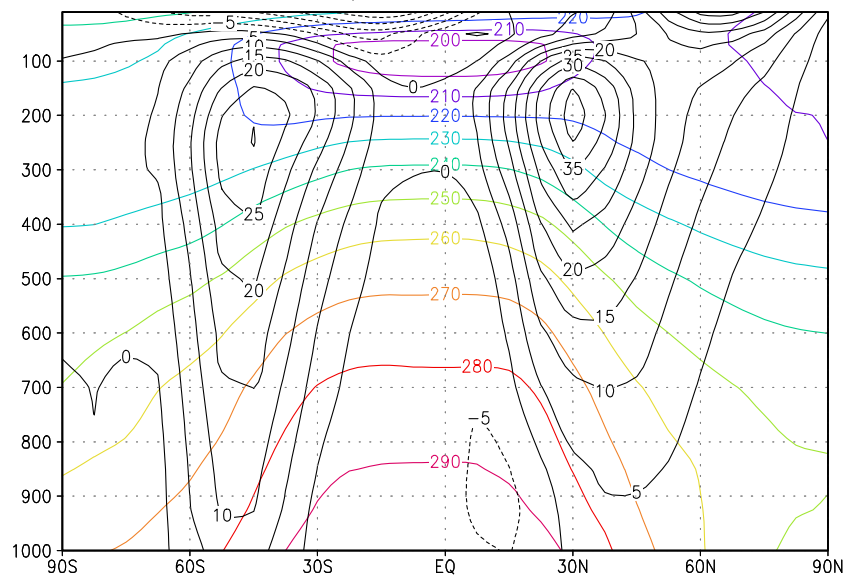

Sea-level pressure (mb), July
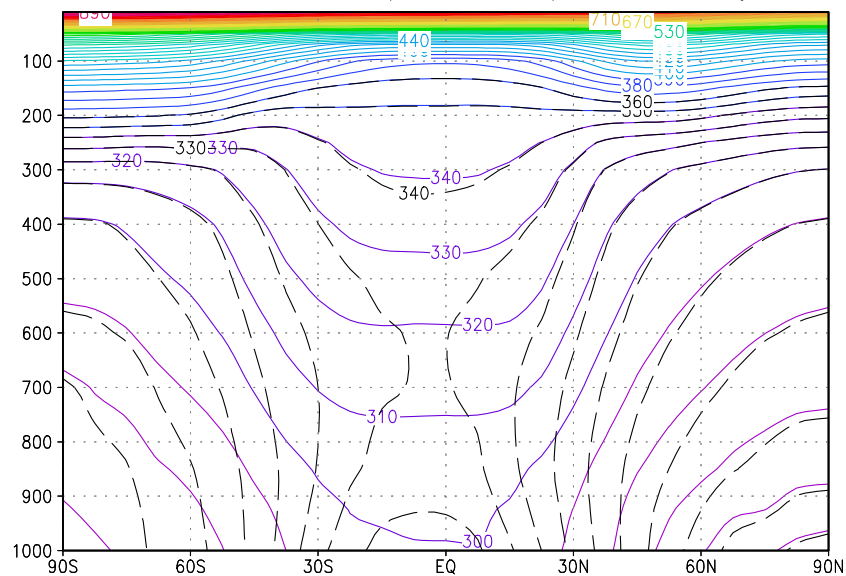

10-m wind, July
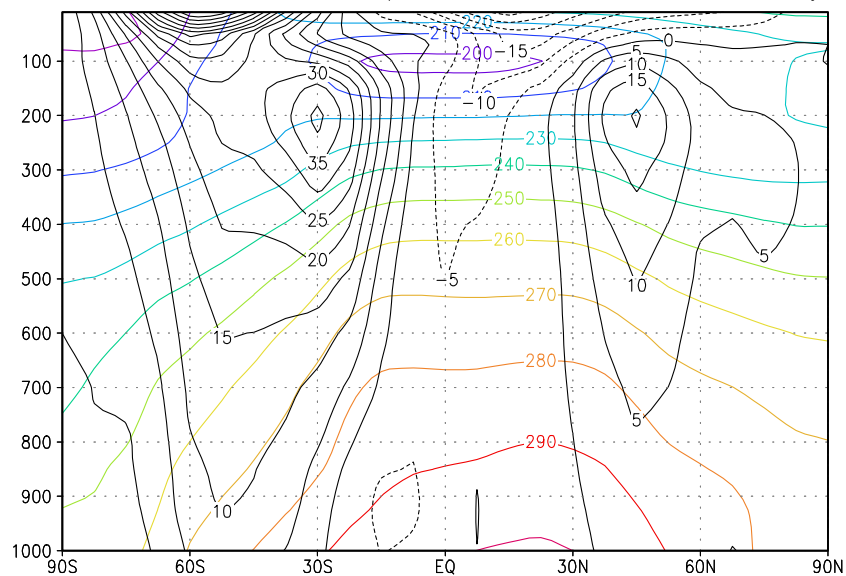
Climatology of the atmosphere
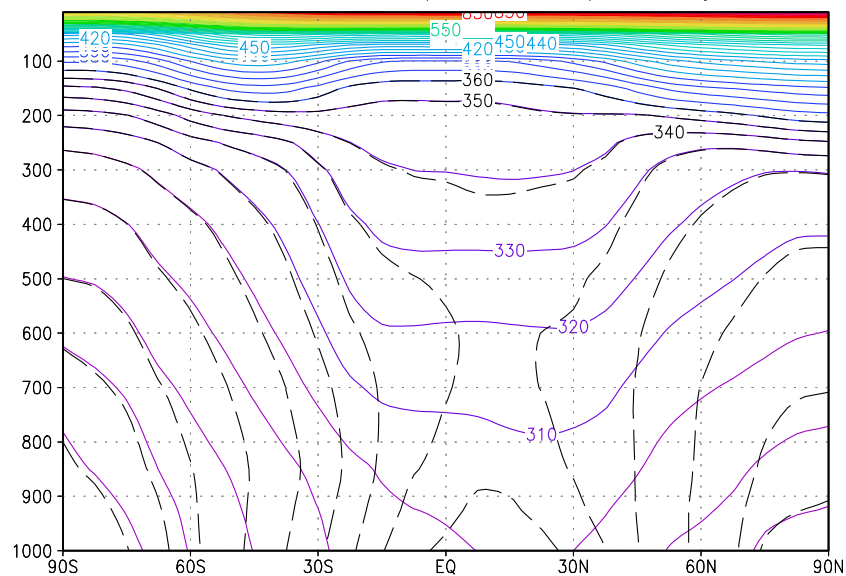
Zonal-mean temp. and zonal wind, January

Zonal-mean pot. temp., January

Zonal-mean temp. and zonal wind, July

Zonal-mean pot. temp., July

Potential temperature θ is the temperature that an unsaturated parcel of dry air would have if brought adiabatically and reversibly from its initial state to a standard pressure p_0, typically 1000 hPa:
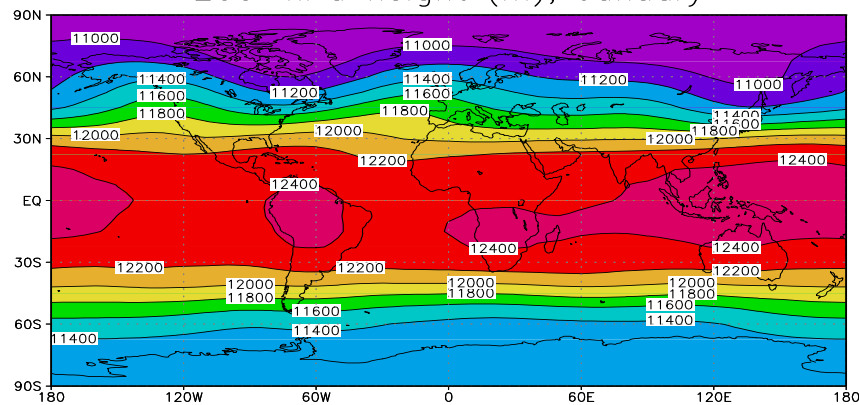
$$\theta = T(\frac{p_0}{P})^{R/C_p}$$

Equivalent potential temperature θ_e is found by lowering an air parcel to the 1000 mb level AND releasing the latent heat in the parcel.

$$\theta_e = T_e(\frac{p_0}{P})^{R/C_p} \approx (T + \frac{Lq}{C_p})(\frac{p_0}{P})^{R/C_p} = \theta \exp(\frac{Lq}{C_p})$$
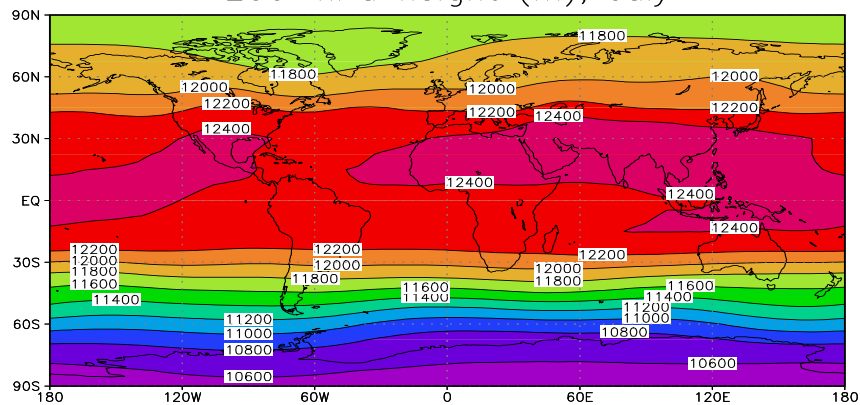
where T_e is the equivalent temperature.
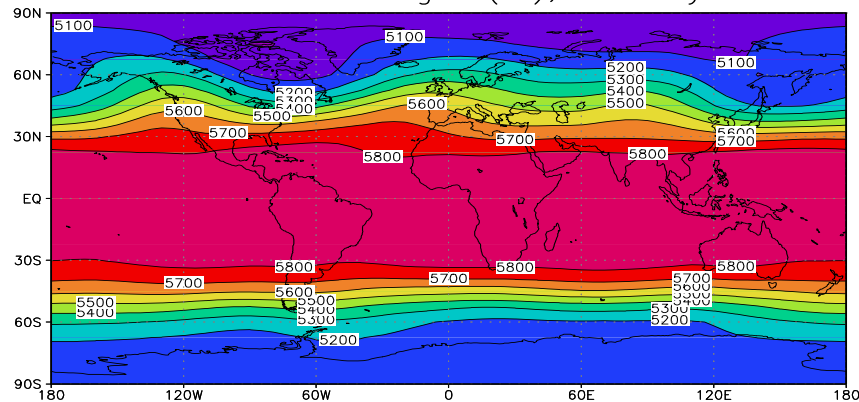
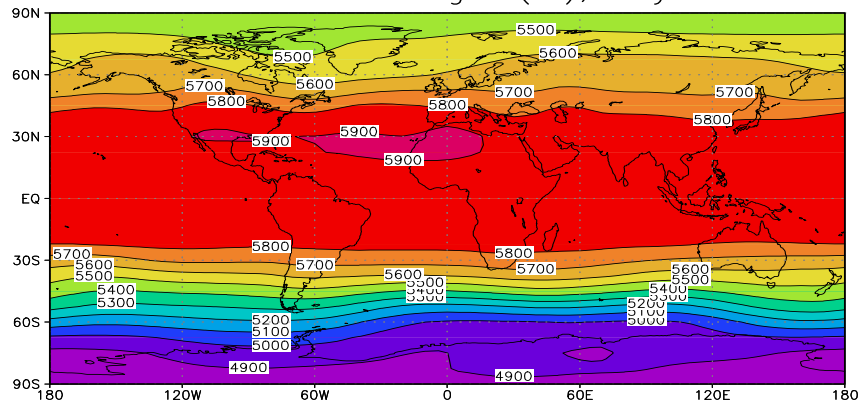# Climatology of the atmosphere

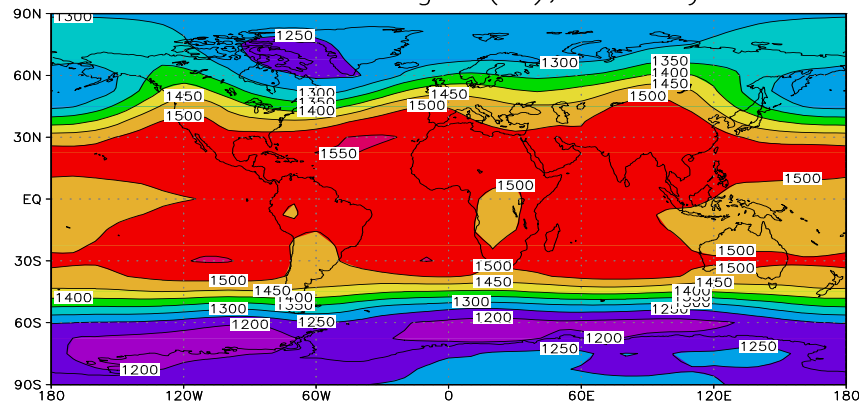200−hPa height (m), January

200−hPa height (m), July
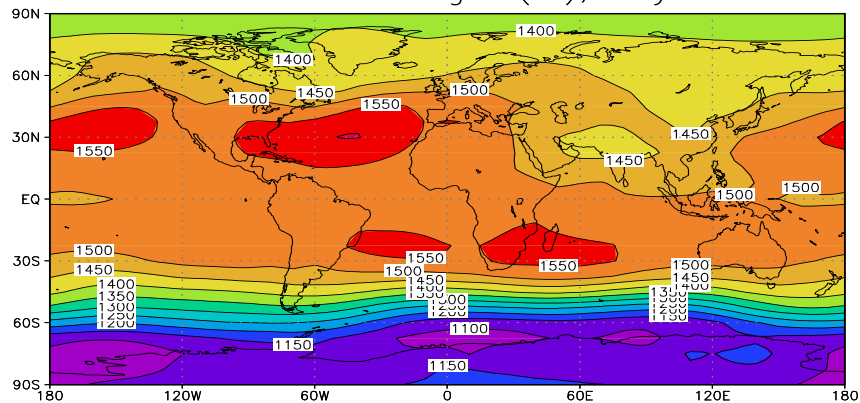

500−hPa height (m), January
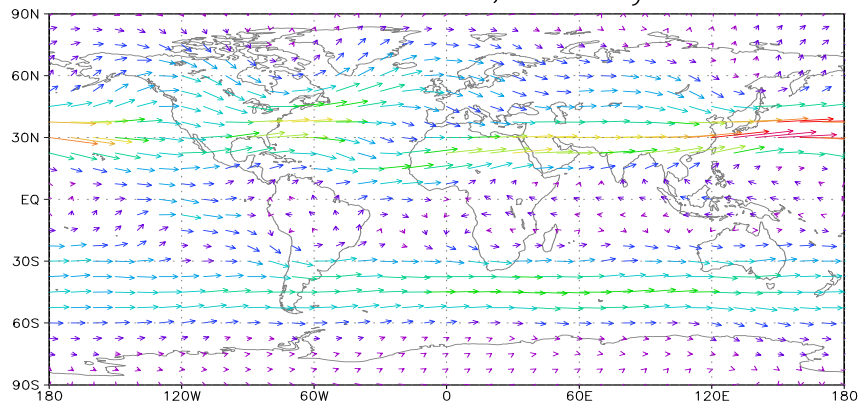

500−hPa height (m), July
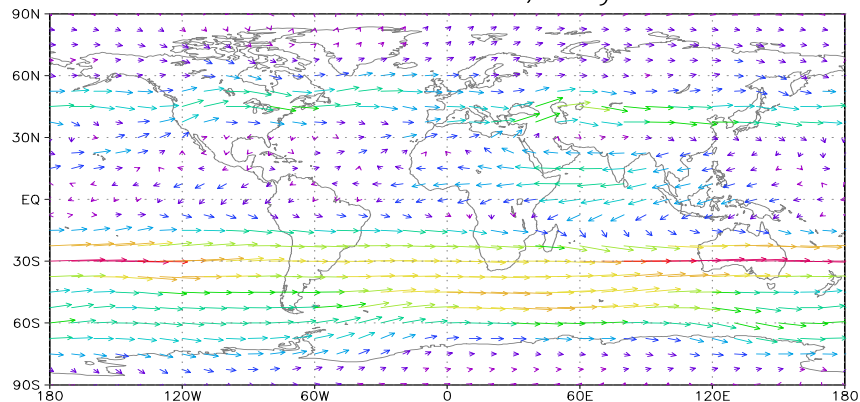

850−hPa height (m), January
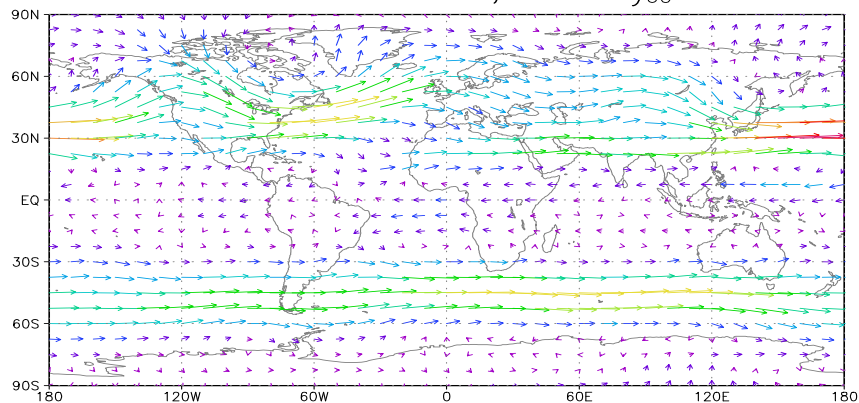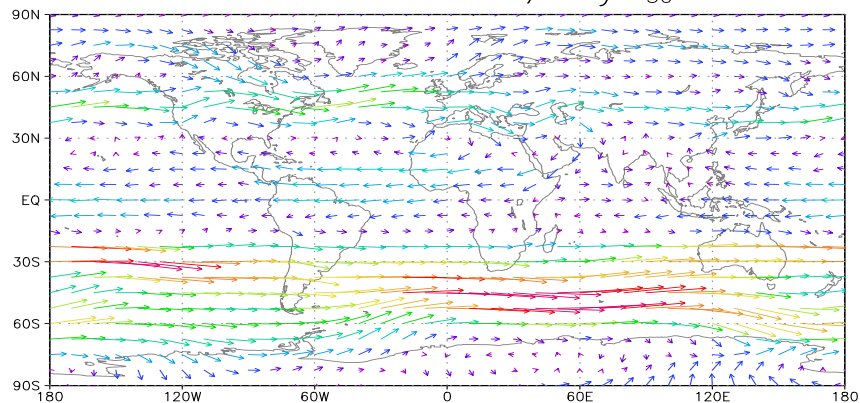

850−hPa height (m), July
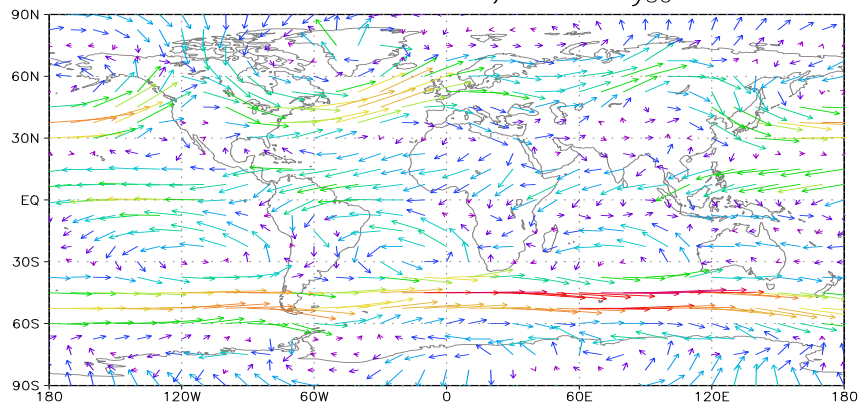
Climatology of the atmosphere
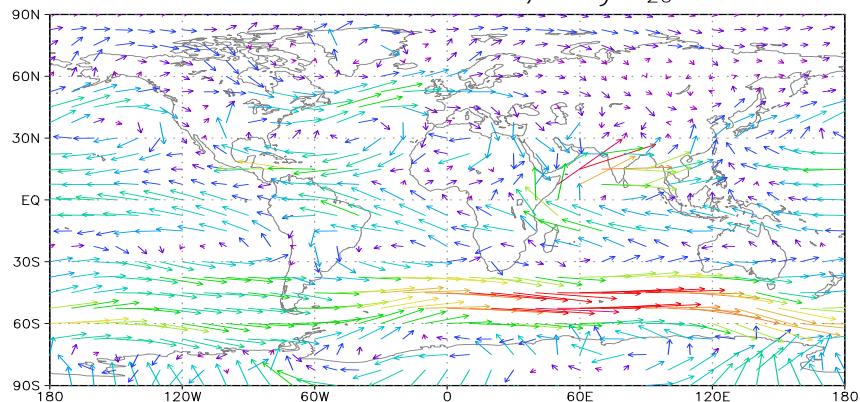
Climatology of the atmosphere

Zonal wind (30N/40N), January