The Earth – Precipitation, Cloud Cover

The distribution of precipitation correlates closely with the global climate zones (Atlas pages 38/39) as well as global land cover and land use (Atlas pages 40/41). The classic climatology map with its 30 years average, and the data measured by satellite during the period 1988 to 1996, generally confirm this. An interesting feature of the satellite data is that they are also available for ocean regions, revealing large areas with very high (along the equator) and very low (e.g. the regions west to South America, South Africa or Australia) precipitation. Average cloud cover also coincides generally with average precipitation, with the exception of the Polar Regions with their relatively low precipitation.

Map Descriptions

Map 1: Average annual precipitation
Satellite/Sensor: -
Acquisition Date: -
Band Combination: -
Map Information: global distribution of the annual precipitation on a shaded relief, intertropical convergence, atmospheric circulation, climate diagrams

Description: The map represents the distribution of the annual global precipitation combined with the shaded relief, particularly the 30 years average from 1961 to 1990 (climatology map). In addition to rainfall it also indicates snow or hail.
The highest precipitation rates can be measured In the tropical climate region. This is a consequence of the Intertropical Convergence (ITC), which is defined as a belt of low pressure where the trade winds of the northern and southern hemispheres flow together. The location of the ITC shows an annual cycle, roughly following the sun's zenith point. This variation affects rainfall in the equatorial region, causing wet and dry seasons in the tropics, and favours the onset of the monsoon.
The subtropical zone, caused by the high pressure belt, is dominated by arid and semi-arid conditions. In the temperate zones, less precipitation occurs where the continental influence increases.
A sequence of climate diagrams for localities along a line from north to south highlights the differences between the seasons in the hemispheres and between continental and maritime climates.

Map 2: Average annual precipitation
Satellite/Sensor: NOAA AVHRR
Acquisition Date: 1988-1996
Band Combination: -
Map Information: NOAA global precipitation

Description: The map shows the global annual precipitation between 1988 and 1996 as measured by satellite. Humid and dry areas of the earth become clearly visible. Extremes are represented by the desert of Atacama in Chile, with no precipitation because of the rain shadow effect of the Andes and Cherrapunji in India, which receives large amounts of rain during the monsoon period.

Map 3: Annual average cloud cover
Satellite/Sensor: NOAA AVHRR, Meteosat
Acquisition Date: 1982-2001
Band Combination: -
Map Information: average cloud cover

Description: The map shows the average cloud cover measured by satellite. The equatorial area is dominated by high cloud cover, whereas in the region of North Africa and Western Australia the average cloud cover is low.

Figure 4: Seasons and day lengths

Figure 5: Atmospheric circulation

Description: With a presentation of the dependency of the day length on season and geographic latitude on one hand and of the global system of atmospheric circulation on the other hand, the Figures 4 and 5 provide background information on processes related with the precipitation distribution.