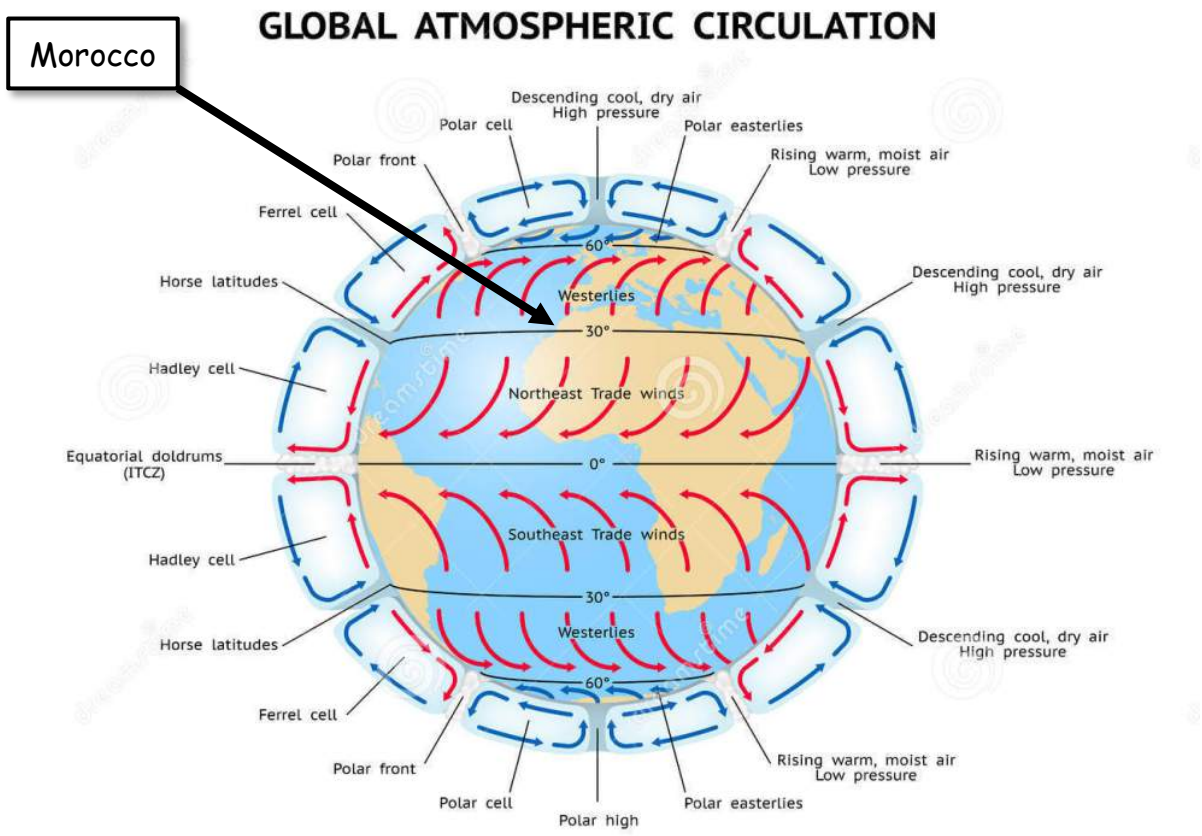
Morocco: Climate

Due to Morocco's physical location the climate has many influences, resulting in at least four distinct climate zones. Not only are there the surface winds of the NE Trade Winds and Westerlies to consider, but also the general global atmospheric circulation with the meeting of the Hadley and Ferrel Cells (Figure 1).

Figure 1: Global atmospheric influences on Morocco



https://hprice2015stm.wordpress.com/weather-hazards-global-atmospheric-circulation/

From the northern border of Algeria to the Strait of Gibraltar, these northern stretches of coast are influenced by a warm and dry Mediterranean climate contributing to mild wet winters and dry summers. Average temperatures range from an average 13°C in January to 23°C in the summer months. Precipitation levels can be somewhat abundant here at approx. 400mm a year, concentrated in winter months from November to April.

Following the coast south of Tangier to Agadir, the warm and moist air is influenced by the Gulf Stream travelling approx. 3,000km over the Atlantic Ocean. Temperatures tend to be mild throughout

the year, from an average of 14°C in January to 22°C in the summer months, although hot African air masses can travel north-west from the Sahara to lift average temperatures to well over 30°C, and sometimes even 40°C! On average, there are 35 days a year in Agadir with precipitation falling, mostly from late autumn to early spring, and not reaching much more than approx. 224mm/year. In contrast, Tangier can receive 735mm/year.

The Atlas Mountains stretch across Morocco diagonally SW-NE, providing a protective barrier to the north from the harsh desert climate found to the south. Historically November and December are generally the wettest months in the mountains with approx. 40mm precipitation each month, with the warmest month in July holding temperatures in the region of 30°C. Altitude plays the influencing role here in temperature range and precipitation levels. At 4,167 metres above sea level, Jbel Toubkal experiences very dry summer months although temperatures can still drop to below freezing above 3,500m. During winter the mountains are covered in snow and provide a vital water source for the lower-lying villages during spring and summer with snow melt.

South and east of the Atlas Mountains is the Sahara Desert. Atmospheric influences here are largely a result of the Horse Latitudes whereby descending dry air from the upper atmosphere (troposphere) in the Hadley Cell creates an intense high-pressure zone. Cloud formation is hindered due to the dry sinking air restricting evaporated water from rising, and thus cloud formation and rainfall is virtually non-existent. The lack of cloud cover and very low humidity brings high diurnal temperature ranges between day and night, typically between 13°C and 20°C. Falling in the rain shadow from any precipitation coming south from the Mediterranean Sea or west from the Atlantic, annual levels are anything from 0mm to 10mm. This harsh environment leads to exceptionally high potential evapotranspiration rates from 2,500mm/year to 6,000mm/year. On only two occasions has snow ever been recorded in the Sahara; February 1979 and December 2016, both in Ain Sefra (Algeria).

Suggested reading

- https://www.climatestotravel.com/climate/morocco