

Review Year 2021

With a mean **air temperature** of 9.6 °C at the DWD station Dresden-Klotzsche, the year 2021 was 0.7 degrees warmer than the annual mean of the reference period 1961 to 1990, to which we adhere for the evaluation of the longer-term climate development. For the first time since 2013, the annual mean temperature was now once again below 10 °C and thus moved somewhat closer to the long-term mean of 8.9 °C than the very warm previous years. In the ranking since 1961, the past year reached 25th place. A "recovery phase" after the previous three years, which were markedly too warm and too dry. This somewhat more "normal" annual mean temperature was primarily due to the spring months of April and May, which were significantly too cold. The largest positive deviation of the 12 months was registered for June with +3.8 K (degrees Celsius), the most significant negative deviation with -1.8 K (degrees Celsius) for April (Fig.1).

In terms of **precipitation**, 3 months in Coswig last year were significantly too wet compared to the long-term mean (January, July and August) and likewise the three months April, September and October were significantly too dry (Fig.2).

In terms of **sunshine**, the year ended with a plus of +105 hours at the DWD station Dresden-Klotzsche; with the strongest deviations in June and October (Fig.3). Overall, this continued the series of years that were too warm and had above-average sunshine.

Weather pattern: In Saxony, little precipitation fell during the first two decades of January. Only the 3rd decade brought us a lot of wet from above. First, it was the low IREK that supplied our region with abundant precipitation as snow or rain on a Vb-train and finally a prominent air mass boundary between very warm air in the southwest and frosty air in the northeast of Germany occupied us, which brought a lot of snow in our region, but also rain at times.

At the end of June 2021, a pronounced omega weather situation set in over Central Europe (trough-wedge-trough pattern). Omega layers are known for being stuck in a certain area for a very long time and, depending on the dominant influence of the trough (high pressure trough) or alternatively the wedge (high pressure trough), can then also lead to flooding or to long-lasting droughts. Furthermore, these pressure formations blocking the westerly flow usually lead to a remarkable consistency of the weather situation and have gained importance in the course of climate change in Europe (cause: change in the properties of the jet stream in the northern hemisphere). With an overall markedly slow eastward shift of the omega weather pattern, Germany increasingly entered the area of the western high pressure low or trough during July 2021, with record precipitation eventually leading to catastrophic flooding over parts of western Germany. These warm and humid air masses, together with the high pressure low, continued to move slowly southeastward and, especially on July 17, triggered heavy precipitation in eastern Saxony (mainly in Saxon Switzerland), which led to local flooding.

In the course of October 21, a storm and hurricane depression spread to Central Europe. In Dresden-Klotzsche, wind peaks reached up to 120 km/h. At this station, it is the highest wind

speed observed so far in October in the series that has existed since 1960. In other parts of Dresden, even stronger gale-force winds of up to 135 km/h were observed. Interestingly, in connection with the passage of the storm low in our region, the hoped-for precipitation did not occur due to strong foehn effects. All in all, the month of October turned out to be considerably too dry.

The year 2021 ended with an annual balance of + 37.8 mm in Coswig overall too wet, although in Saxony comparison our region was very disadvantaged in terms of precipitation. In Dresden-Klotzsche there was a plus of + 64.8 mm.

Note: The summer of 2021 in the Coswig-Radebeul region was too warm, too wet and above average in terms of sunshine compared to the reference period 1961-1990. After the pronounced drought stress of recent years, nature was able temporary to "breathe again" this summer after a long dry spell.

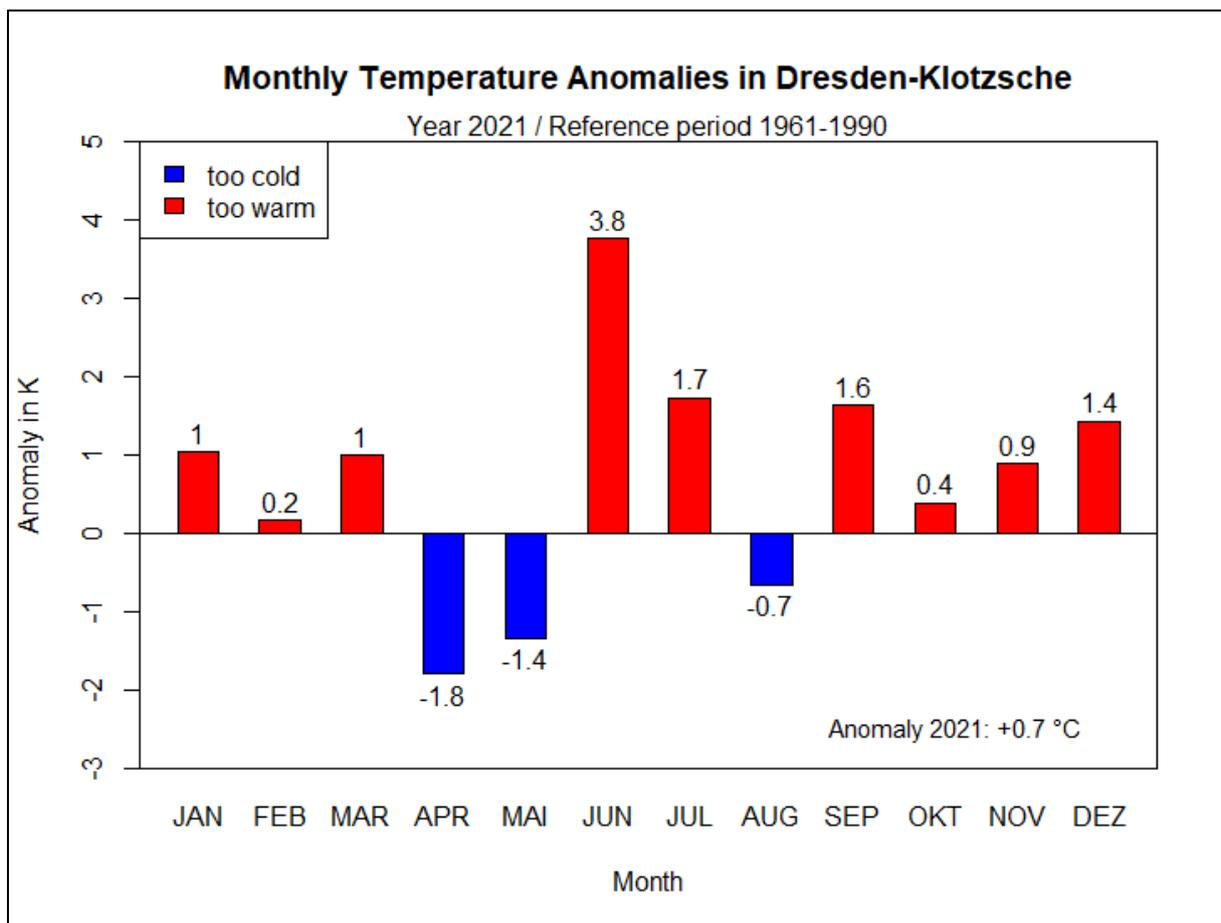


Fig.1: Monthly anomalies of air temperatures in 2021 at the DWD station Dresden-Klotzsche. Colors: blue (too cold) and red (too warm).

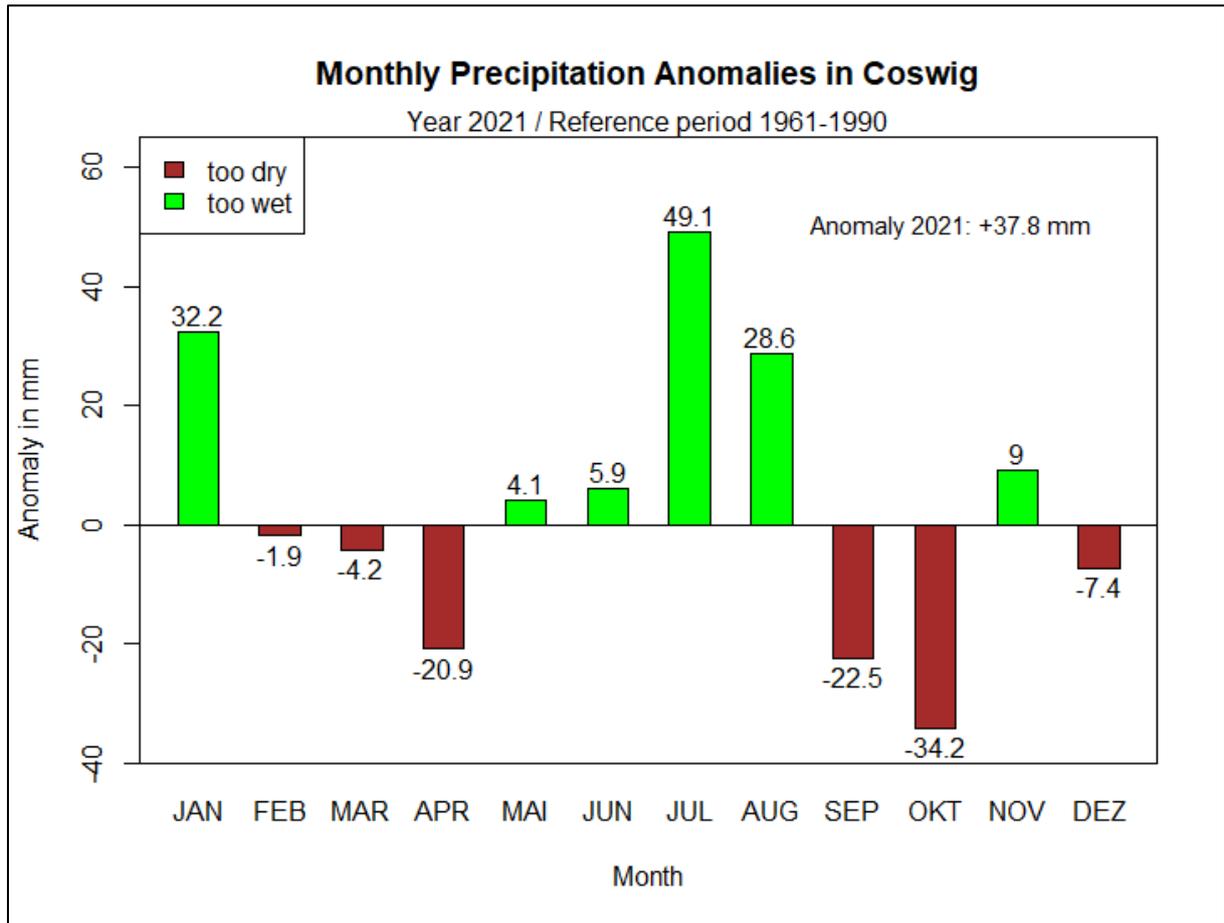


Fig.2: Monthly anomalies of precipitation in 2021 at the IKG station Coswig. Colors: green (too wet) and brown (too dry).

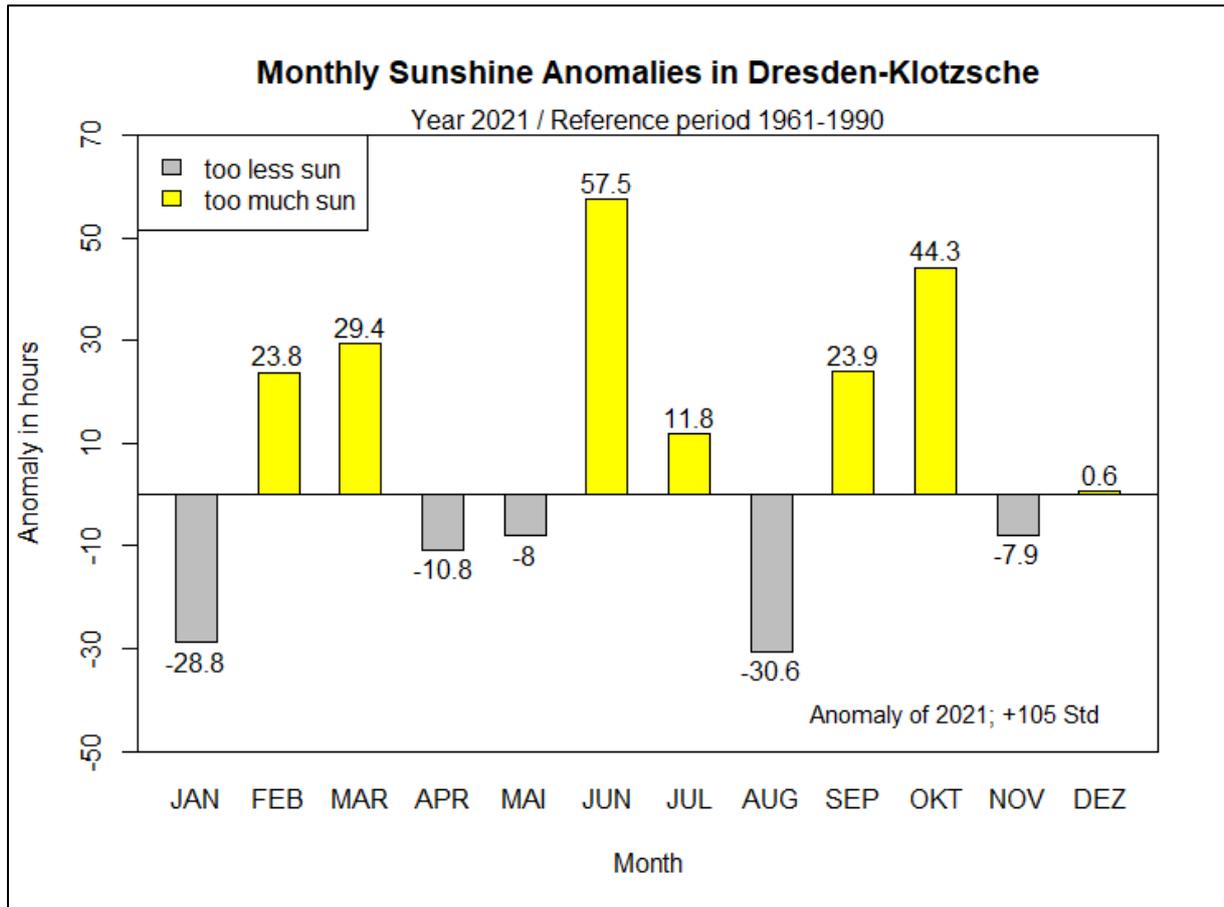


Fig.3: Monthly anomalies of sunshine duration in 2021 at the DWD station Dresden-Klotzsche. Colors: yellow (excess sunshine) and gray (lack of sunshine).