THE ITALIAN CLIMATE IN 2023: A PRELIMINARY ASSESSMENT

Here, a preliminary summary of the 2023 climate state is presented. The information reported are not definitive: the updated estimates and the full analysis of climate indices and indicators will be part of the Italian climate annual report by SNPA, to be published in July. The SNPA report will also contain specific focuses about the Italian climate features in 2023, from the national to the local scale, featuring contributions from SNPA agencies. Focuses will deal with: drought and hydrological severity, who affected northern and central regions during the first months of 2023 and Sicily and Sardinia at the end of the year; floods, with several focuses about 2023 tragic events, including the great flood hitting Emilia-Romagna in May; significant hydro-meteoclimatic events, referring to rain and hail storms that hit Northern Italy in July; high temperatures characterizing the whole year, with high peaks recorded locally.

TEMPERATURE

Based on preliminary data, 2023 is the 2nd warmest year on record since 1961, where the 1st place belongs to 2022. The 2023 mean temperature anomaly is +1.07°C with respect of the climatological reference 1991-2020. 2023 is the 10th consecutive year with a positive anomaly. Starting from 2000, all years have positive anomalies (Fig. 1), with the exceptions of 2004, 2005, 2010 e 2013.
Still by using preliminary data, the minimum temperature anomaly for 2023 set the highest record from 1961 (+1.06°C), while the maximum temperature anomaly is the all-time 2nd on record.

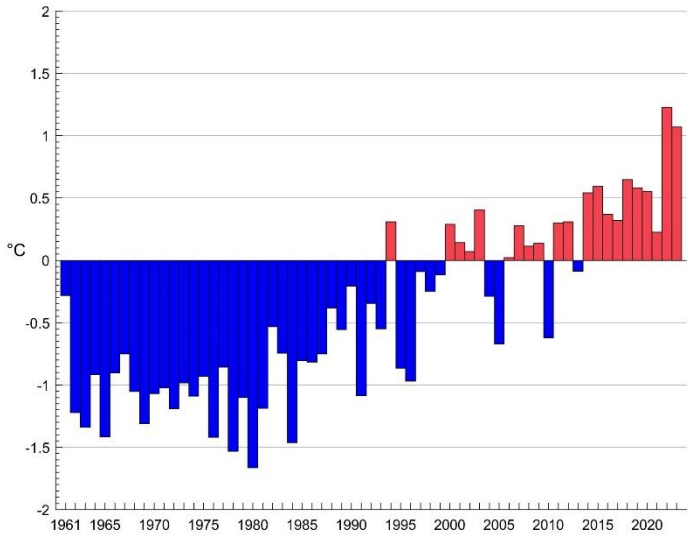

Figure 1 *– Yearly series of mean temperature average anomaly in Italy, with respect to the 1991-2020 reference.*

On a seasonal basis, the strongest anomaly has been recorded in autumn (+2.09°C), the highest one from 1961. Positive anomalies have been also recorded for winter (+1.19°C) and summer (+1.01°C); spring resulted into a value close to the climatological reference. Concerning winter, the anomaly is computed by aggregating January and February 2023 with December 2022.
The monthly anomalies reported in Fig. 2 highlight the positive values for the entire year, except April and May. A strong peak is visible in October (+3.23°C), representing the highest value for this month from 1961. December, with an anomaly of +1.77°C, is the 2nd warmest from 1961, following the record of 2022.

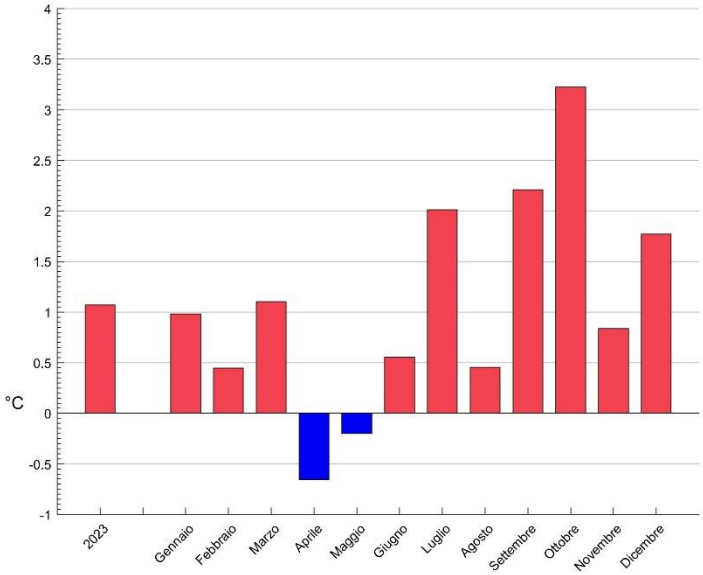

Figure 2 *– 2023 monthly average anomaly of mean temperature, with respect to the 1991-2020 reference*

PRECIPITATION

Based on preliminary data, 2023 recorded an overall -3% anomaly with respect to the 1991-2020 climatological reference (Fig. 3), very close to it.
Seasons below the reference for 2023 were autumn (-22%) and winter (-4%), while the ones wetter than the reference were spring (+28%) and summer (+24%). Concerning winter, the seasonal total precipitation is determined by aggregating January and February 2023 with December 2022.
The series of total precipitation monthly anomalies for 2023 (Fig. 4) show an up-and-down behaviour of precipitation during the year. May recorded a +142% anomaly, top value since 1961 and 4th among all months from 1961. June recorded a +78% anomaly, 3rd value since 1961. The relatively driest month on average has been February (-53%), followed by September (-51%).

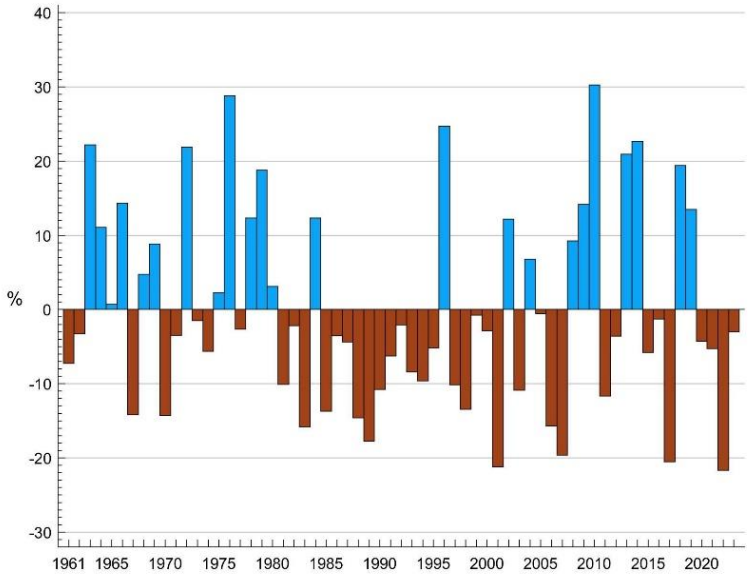

Figure 3 *– Yearly series of total precipitation average anomaly, in percentage, with respect to the 1991-2020 reference*

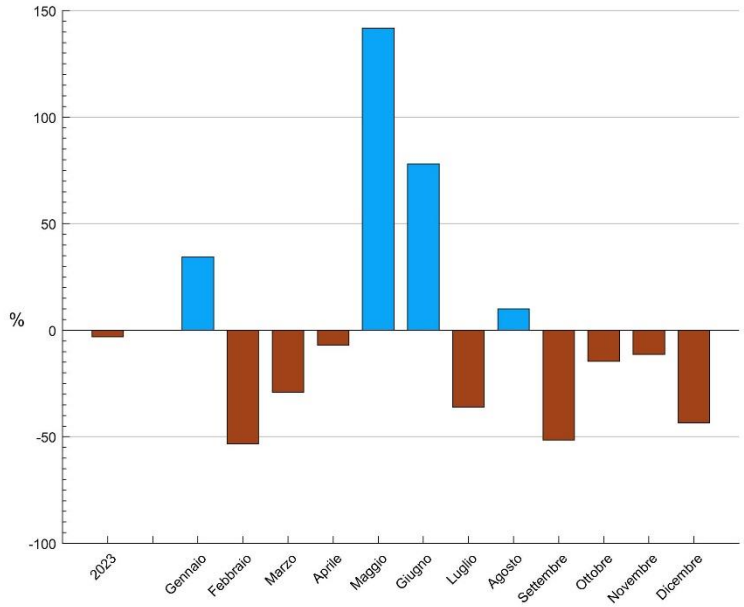

Figure 4 – *2023 monthly average anomaly of total precipitation, with respect to the 1991-2020 reference*

On the SNPA website, under menu “meteo and clima” (https://www.snpambiente.it/category/temi/meteo/), several concise climatic evaluations on regional scale are available, including references to climate records recorded locally and relevant hydro-meteoclimatic events.