

**ClimEd 3rd Online Training on "Digital tools
and datasets for climate change education"**

**The impact of climate change on the
development of agriculture in the Lviv region
of Ukraine**

Group C8:

Babenko Olena (BTNAU)

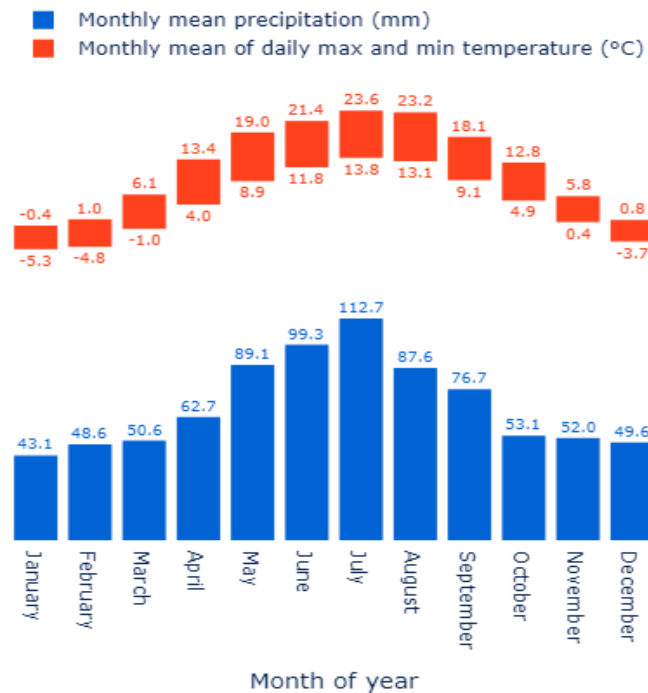
Zavalniuk Vitalii (KNUCA)

Sliusar Vira (LPNU)

General climatic characteristics of the region

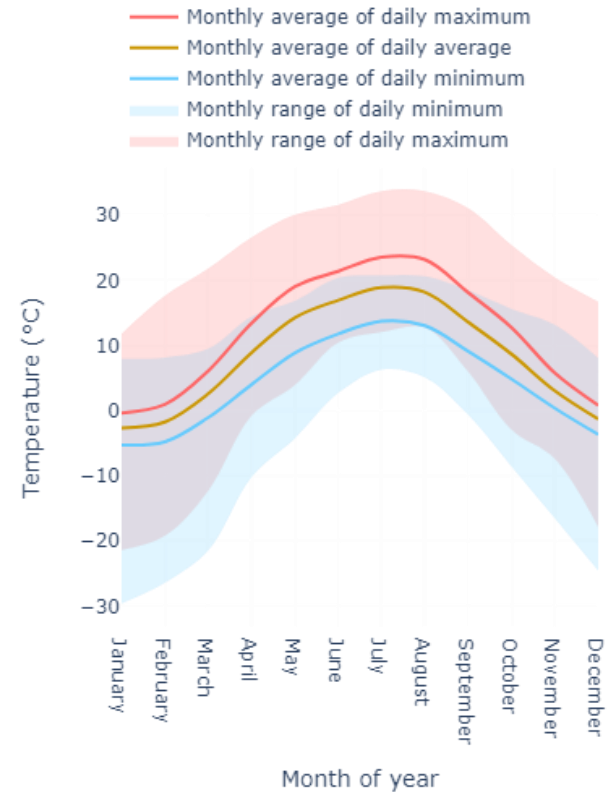
Lviv region is located in a strip of temperate-continental (at the transition from sea to continental) climate.

The average temperature in January is -5°C , in July from $+18^{\circ}\text{C}$ in the central part of the region and up to $+12^{\circ}\text{C}$ in the mountains. The amount of precipitation is 750 - 1000 mm.



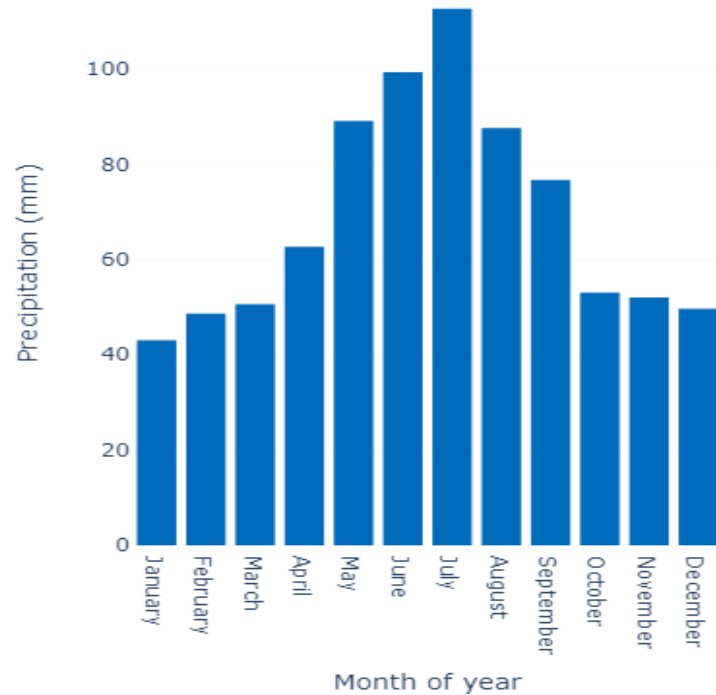
1. Temperature Regime

The average temperature in January is -5°C , in July from $+18^{\circ}\text{C}$ in the central part of the region and up to $+12^{\circ}\text{C}$ in the mountains.



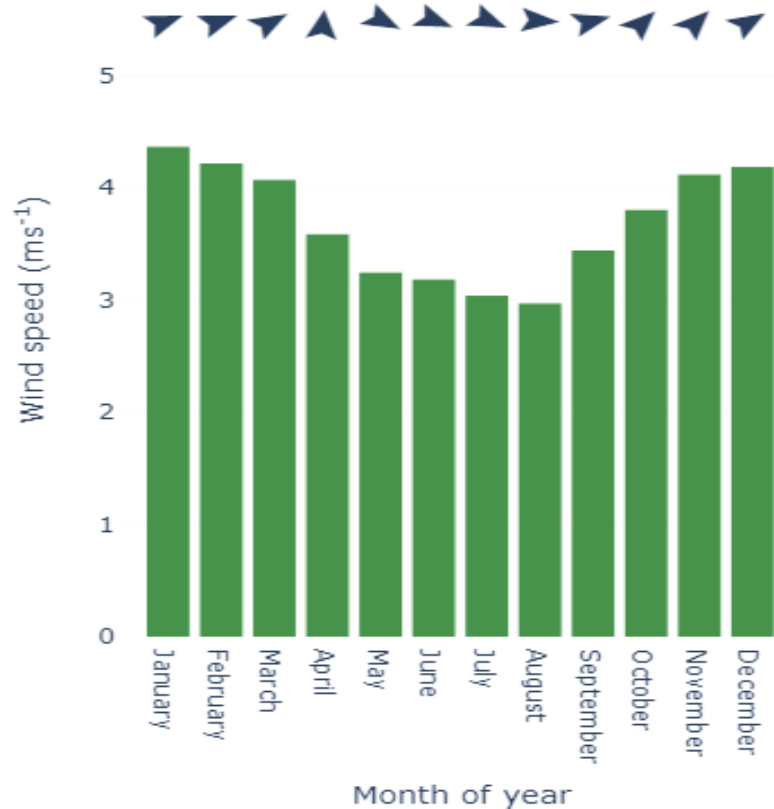
2. Precipitation

Lviv region is characterized by quite significant amounts of precipitation per year. The increase in precipitation in the area, which is associated with cyclopean activity, is facilitated by the Carpathians, where they are particularly abundant. The average annual precipitation varies from 579 to 1070 mm. The largest number occurs in June-July and is 90-140 mm per month, the smallest - in January-February (24-40 mm per month).



3. Wind Speed

Weak and moderate winds with a speed of 0-5 m/sec (70-90% per year) are most often repeated in the region. The wind with the speed of 0-1 m/sec is most often repeated in summer, with the speed of 2-3 m/sec the same during the year, and with the speed of 4-5 m/sec - in winter. In the cold season there are winds with a speed of 6-10 m/sec. Velocities greater than 10 m/sec are rare in the region. Monthly average wind speed ranged from 3.0 ms^{-1} (August) to 4.4 ms^{-1} (January).



4. Solar Radiation

Latitude ($49^{\circ} 50'$), where the territory of Lviv region is located, receives up to 163.3 kcal/cm^2 of total radiation per year. However, the true values of total radiation in the region are much smaller and for the year are 92.4 kcal/cm^2 .

The actual total radiation is only 60% of the possible. This difference between the possible and actual total radiation is due to significant clouds over the region during the year. In Lviv, there are only 50 clear days a year and almost 150 gloomy days when the sky is completely covered with clouds; the remaining 150 days of the year are marked by variable clouds.

5. Weather Disasters

The most common natural meteorological phenomena that occur in the Lviv region include intense heavy rains, heavy blizzards, snowfalls, strong winds, squalls, fogs, dust storms, ice, and heavy hail.



Climate change forecasting

From 1880 to 2012, the temperature rise on the planet was 0.85 °C. In Ukraine, warming is somewhat faster - at the end of 2017, the average annual temperature increased by 1.1 °C.

In the Lviv region, the number of days with high daytime air temperatures (above 30 °) has doubled. Such "heat waves" can cause premature ripening of spring crops and reduce their yields.

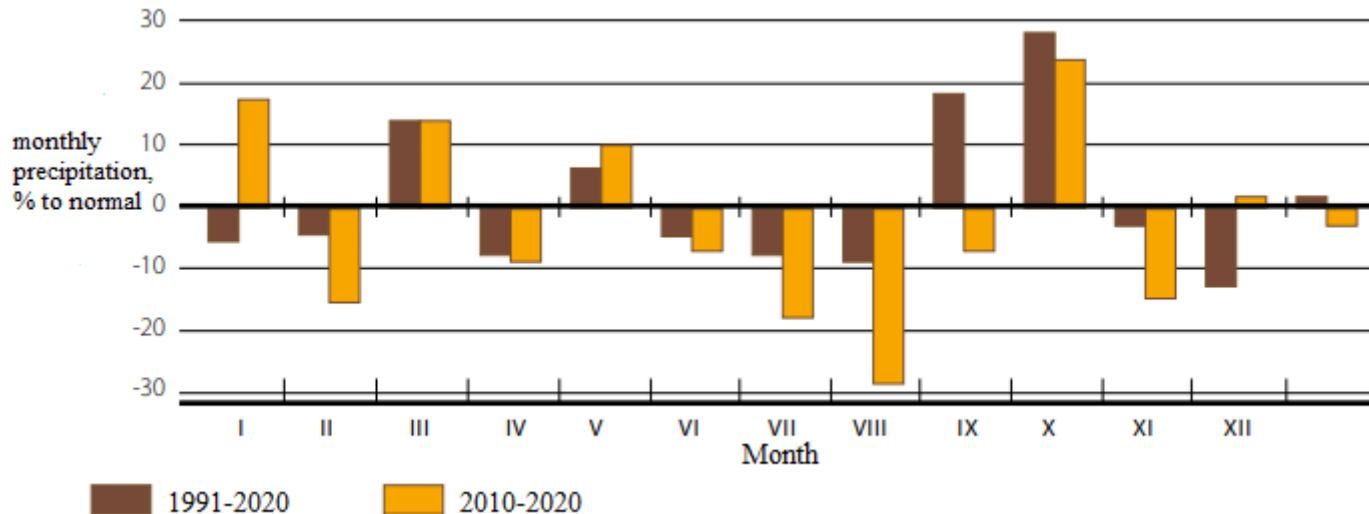
Already today, the duration of active vegetation has increased by an average of 10 days. By 2030, the period of growth and development of thermophilic crops is likely to continue for another 10 days.

The temperature in winter increased by 1.5-2 °C, and the depth of soil freezing decreased to 20-70 cm, which is a favorable factor for the assimilation of winter precipitation by the soil and the formation of sufficient soil moisture in the spring.

A further increase in temperature is expected throughout Ukraine (over 1.2 °C, which has already been recorded for the last thirty years), mostly in the winter and summer seasons. It is likely that by the end of the century the increase will be 2-4 °C. Warming to 2-2.5 °C can increase the yield of many crops in the study area. However, outside of this warming, the yield of all crops will decrease.

The growing season for growing crops is already beginning and will come earlier and last longer, which will increase crop productivity.

How precipitation will change remains extremely uncertain, but a significant increase in its number is unlikely and threatens to increase droughts and increase land areas prone to desertification.



Species of plants that will give a good harvest in conditions of climate change

Analyzing information on climate change, which indicates an increase in temperature, a crop that grows well and gives a good harvest is sunflower. As the temperature rises and the number of sunny days increases, moderate humidity is conducive to the growth of this crop.



Thank you !