



State Emergency Service of Ukraine

UKRAINIAN HYDROMETEOROLOGICAL CENTER

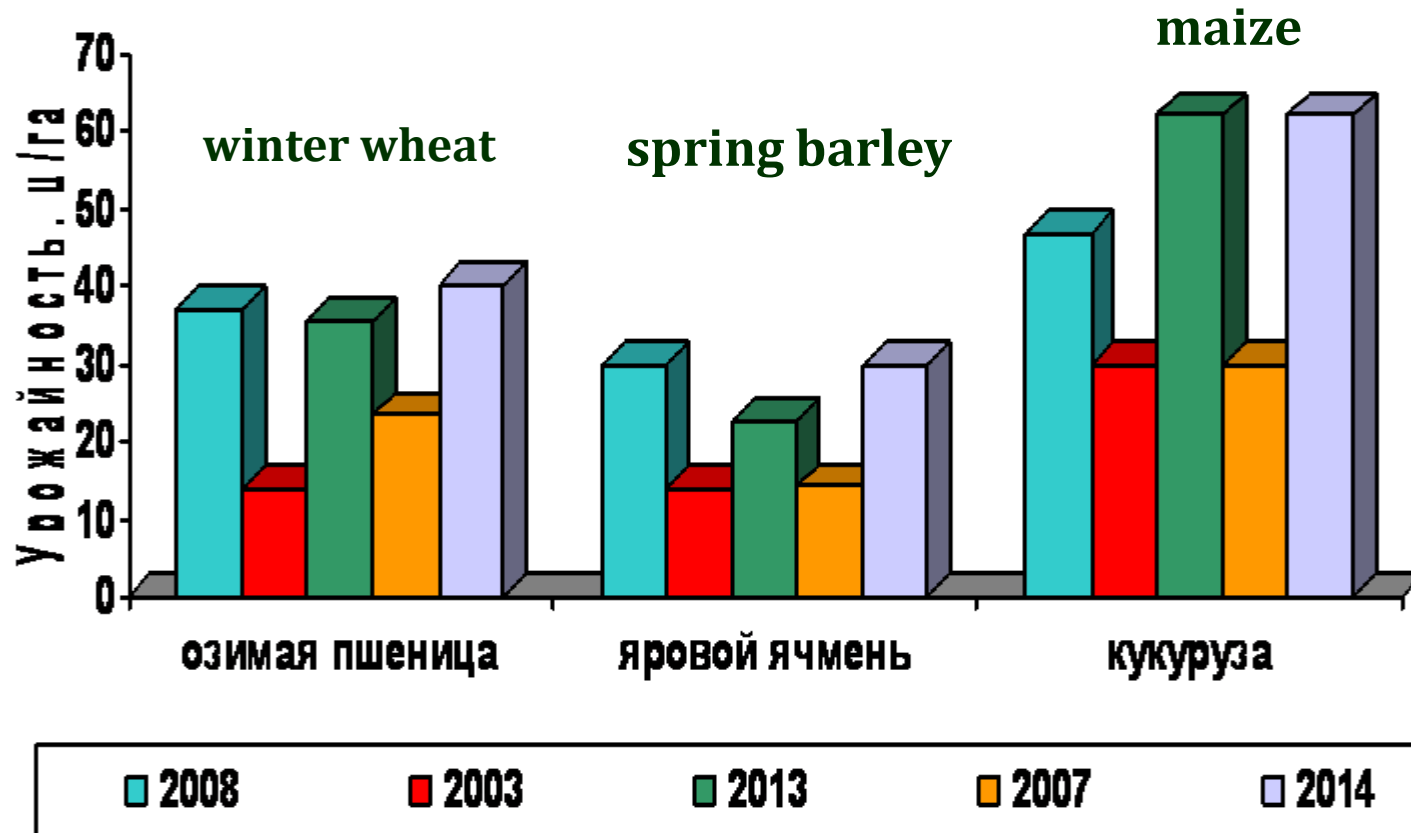
Agricultural drought monitoring in Ukraine

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1. The frequency of severe drought conditions and crop losses of winter wheat

Drought	Number of years	Period 1971-2016	Yield losses, center / ha
Coverage - more than 30% of the area	16	1972,1975,1979,1981, 1983, 1986,1994,1995,1996, 1999, 2003, 2007, 2012, 2010, 2015, 2016	7-10

2. Yields of main agricultural crops in Ukraine during the severe droughts of the 21st century (2003, 2007) and in the wet years (2008, 2013, 2014).



The heaviest losses from droughts are from 30% up to total loss of the crop. In 2003 and 2007 (spring drought) losses in grain production in Ukraine amounted to more than 3 bln. Euro.

3 Monitoring of droughts in Ukraine is carried out by hydrometeorological stations

- Collection and automated processing of information**
- Generalization, systematization, analysis, use in drought models**
- Preparing expert opinions and recommendations**
- Informing consumers of different levels**

4. Weather stations



5. Collection and processing of agrometeorological information in Ukraine

Ukrainian Hydrometeorological Center
Control synthesis, the use of service

Regional Hydrometeorological Centre (23)
Control, synthesis, transfer to Ukrainian Hydrometeorological Center
, the use of service

Meteorological station area (164/122)
Meteorological, phenological observations,
identification of stocks of productive moisture in the soil, the transfer
to a Regional Hydrometeorological Centre

6. Drought Indices

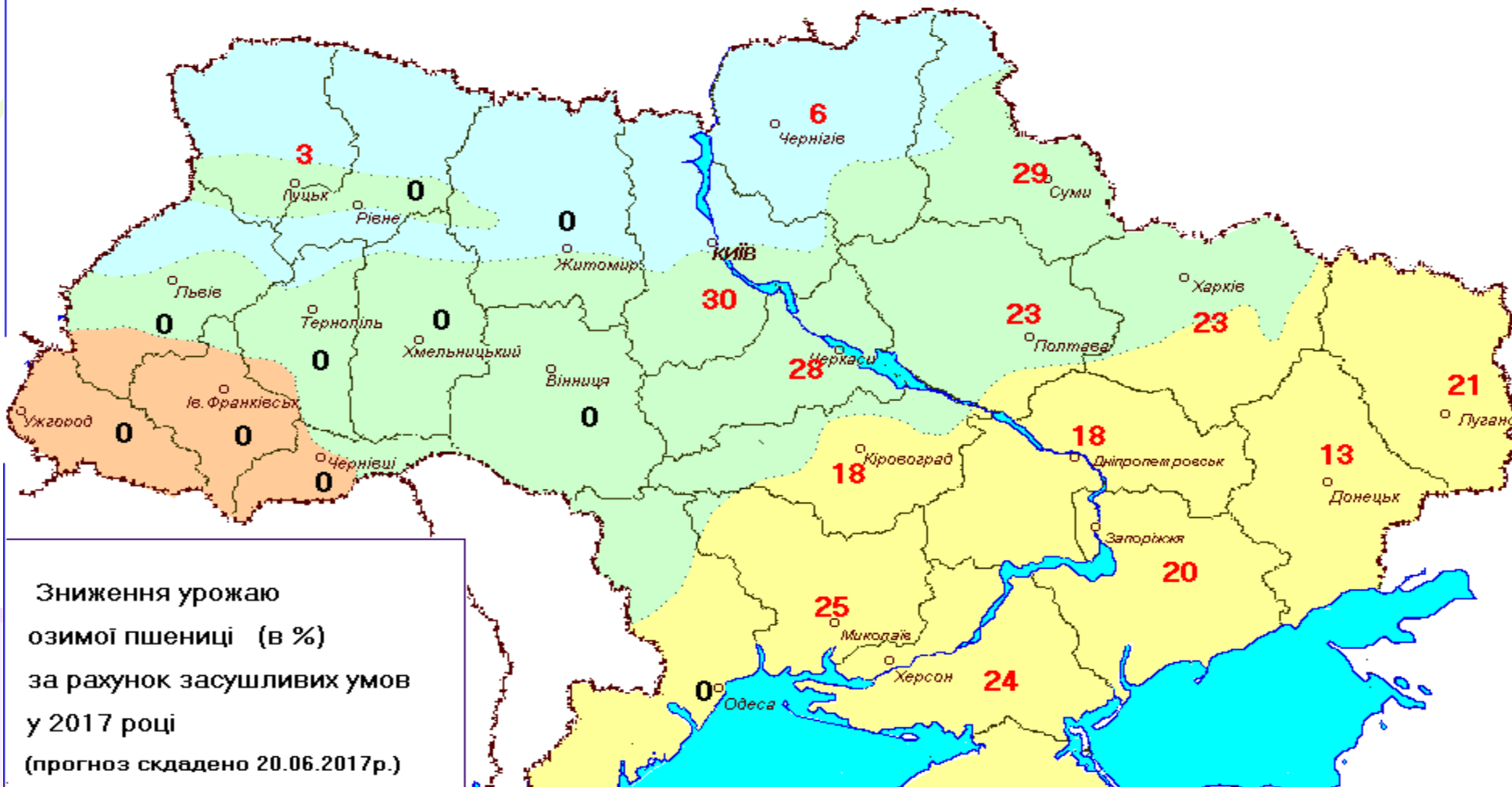
- 1) Selyaninov's hydrothermal coefficient (HTC);
- 2) Shashko's humidity coefficient (Md);
- 3) Protserov's humidity supply coefficient (V,%);
- 4) the number of days with relative air humidity $\leq 30\%$ (No);
- 5) the number of days with maximal air temperature $> 30^{\circ}$ C (NT);
- 6) accessible soil moisture content in soil layer 0-20 cm under winter, early spring and late spring crops (W0-20);
- 7) accessible soil moisture content in soil layer 0-50 cm under winter, early spring and late spring crops (W0-50);
- 8) accessible soil moisture content in soil layer 0-100 cm under winter, early spring and late spring crops (W0-100).
- 9) SPI



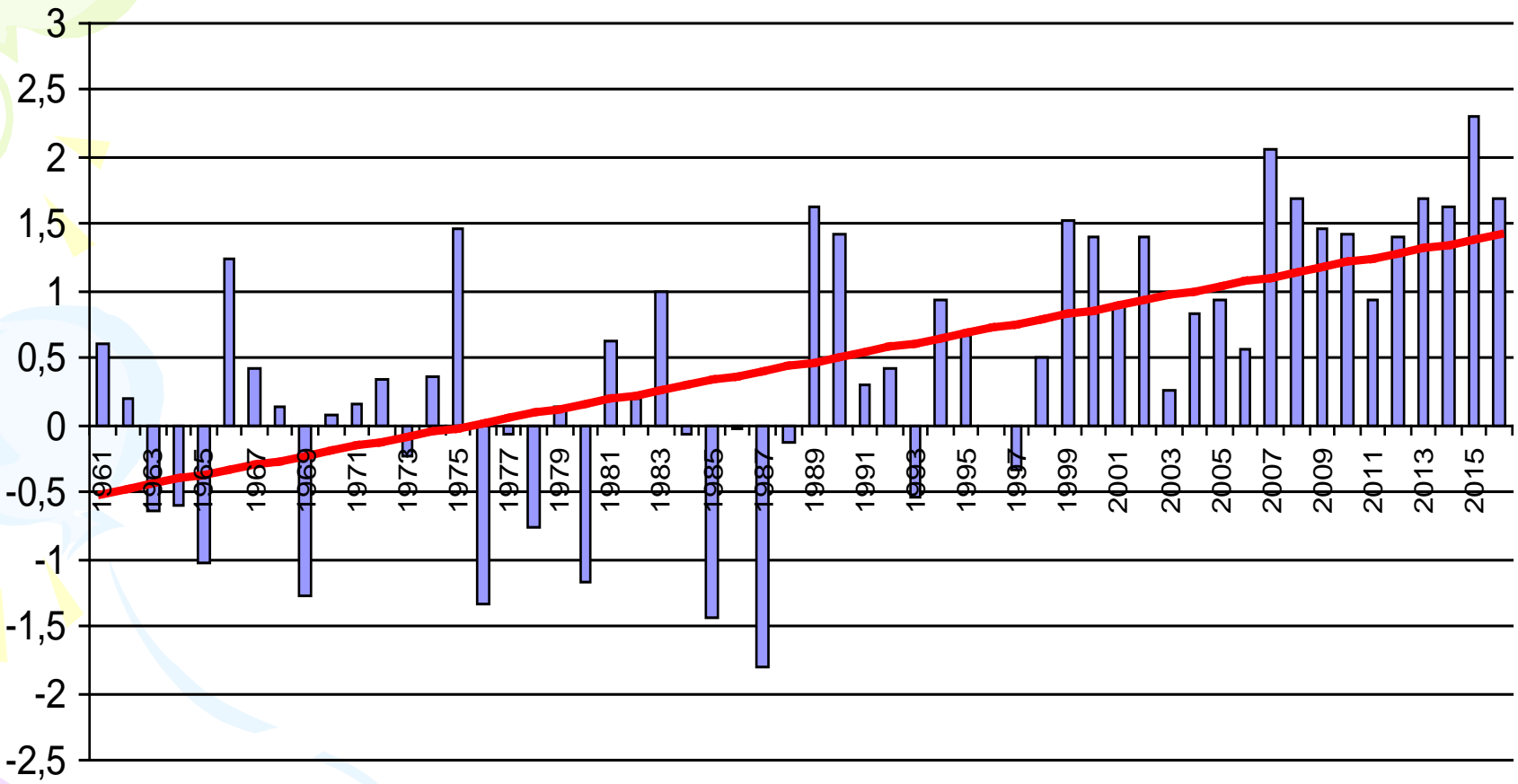
7.

- The system of drought notification incused info releases in different mass media outlets, in 10-days agro-meteorological newsletters, as well as weather forecasts, special operational information releases for different users - from farmers to the Government.

8. Calculation on the model of a possible reduction in yield, % Winter wheat. June. 20. 2017



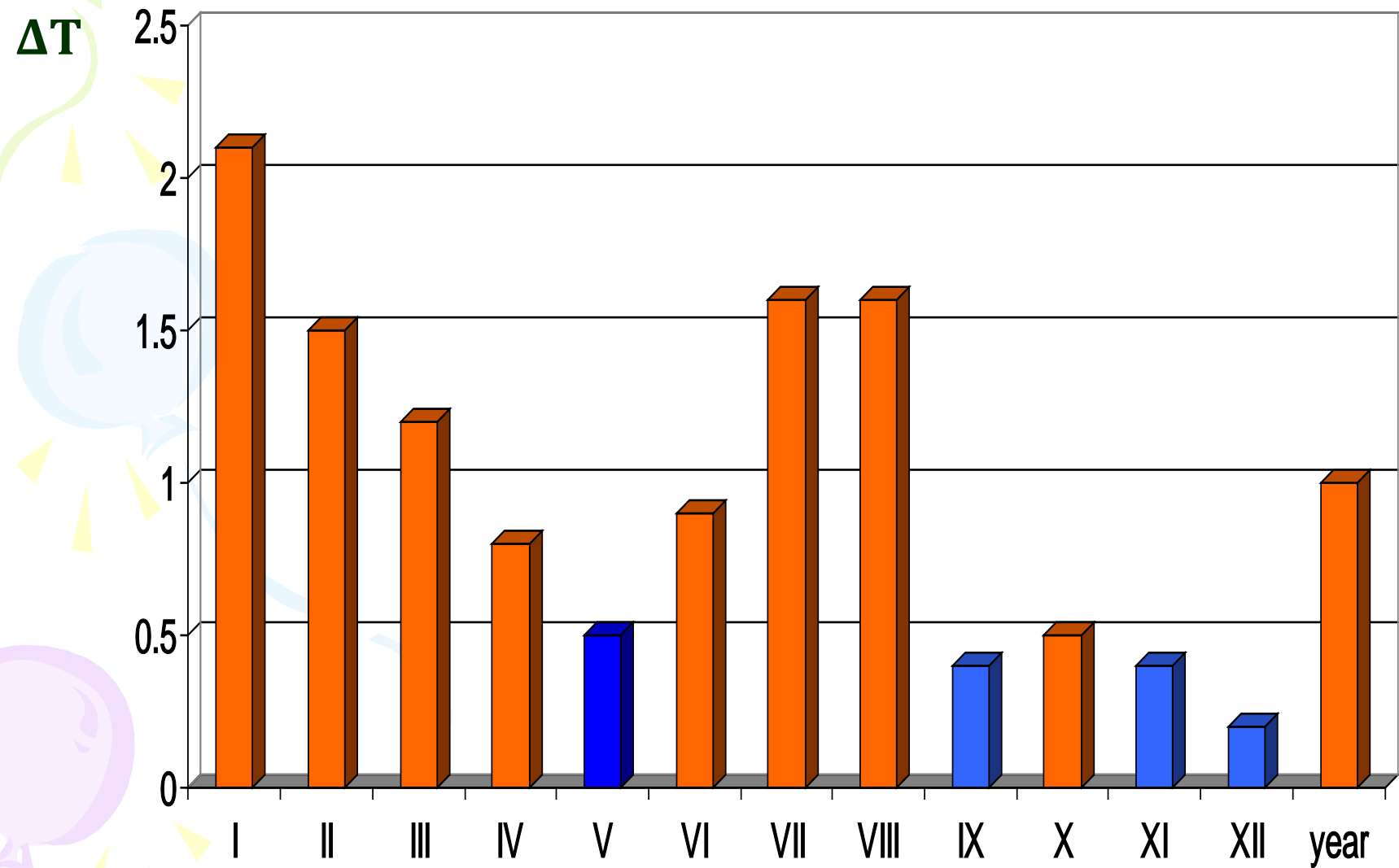
9. The anomalies average annual air temperature for the period 1991-2016 compared with the base period (1961-1990)



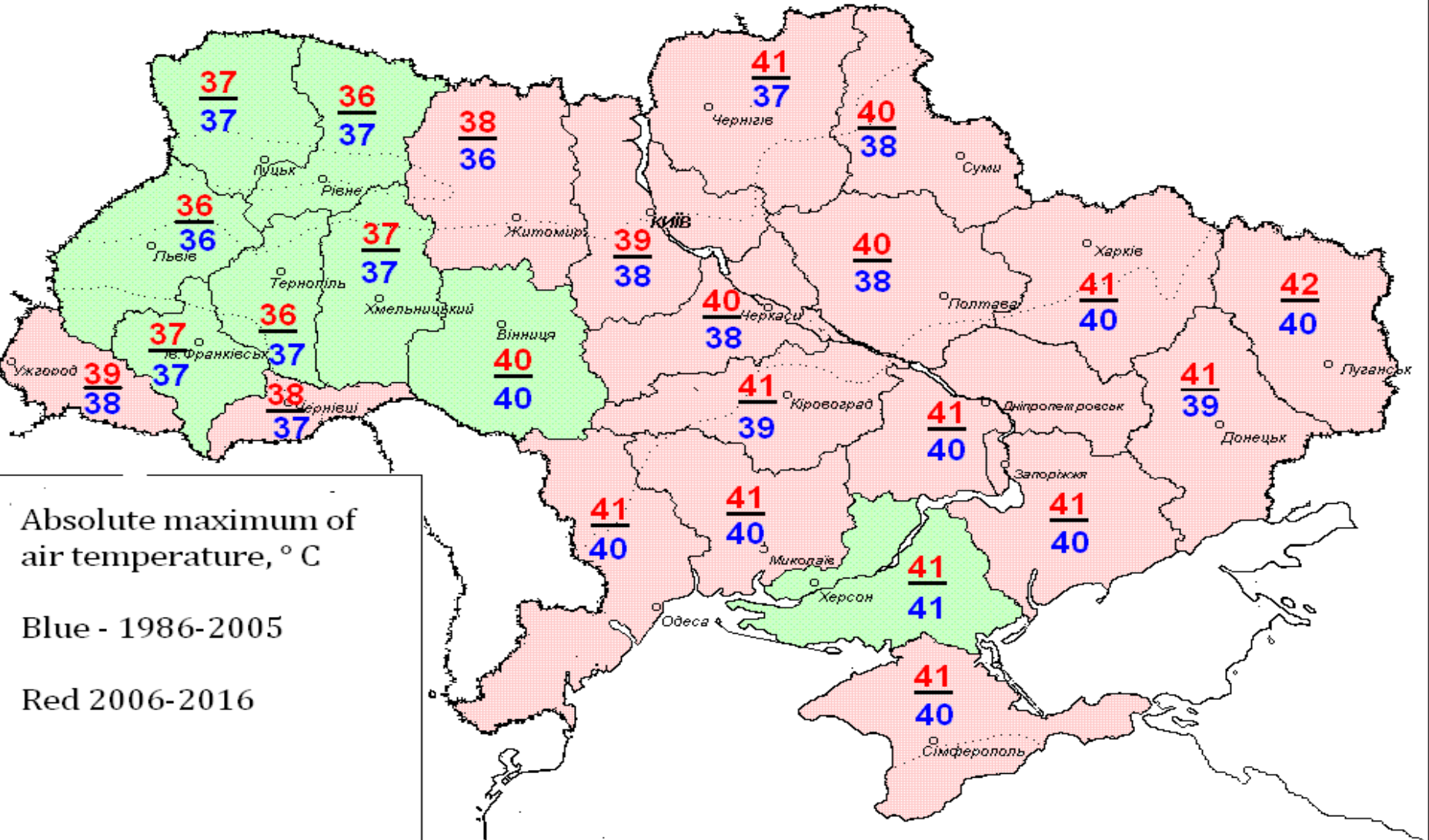
Norm (1961-1990) = 8,0°C

Average temperature 1991-2016 = 9,0°C

10. The anomalies of mean monthly air temperature ($^{\circ}\text{C}$) for the period 1991-2016 compared with the base period (1961-1990)



11. Exceeding of the absolute maximums of air temperatures, °C

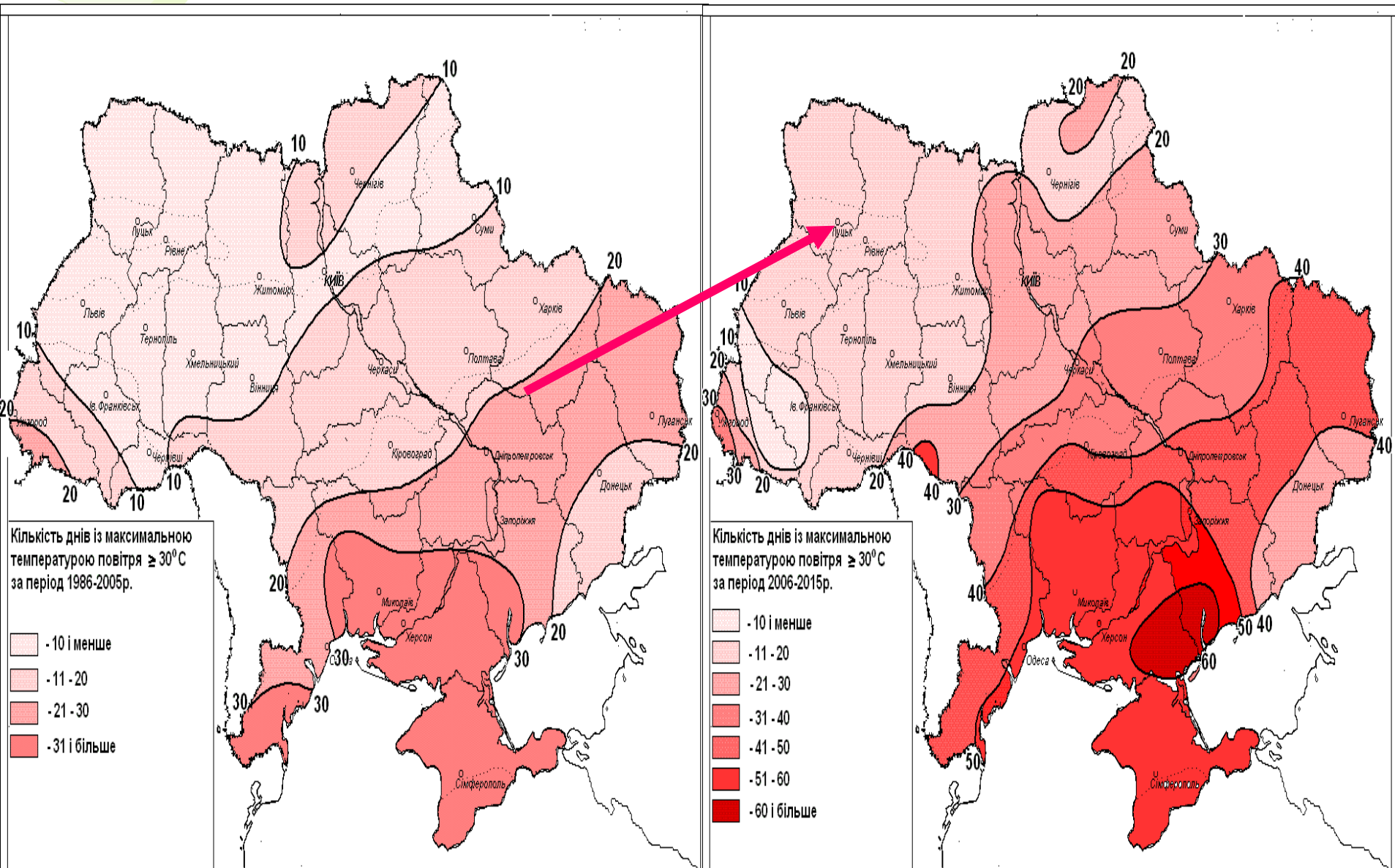


Absolute maximum of air temperature, °C

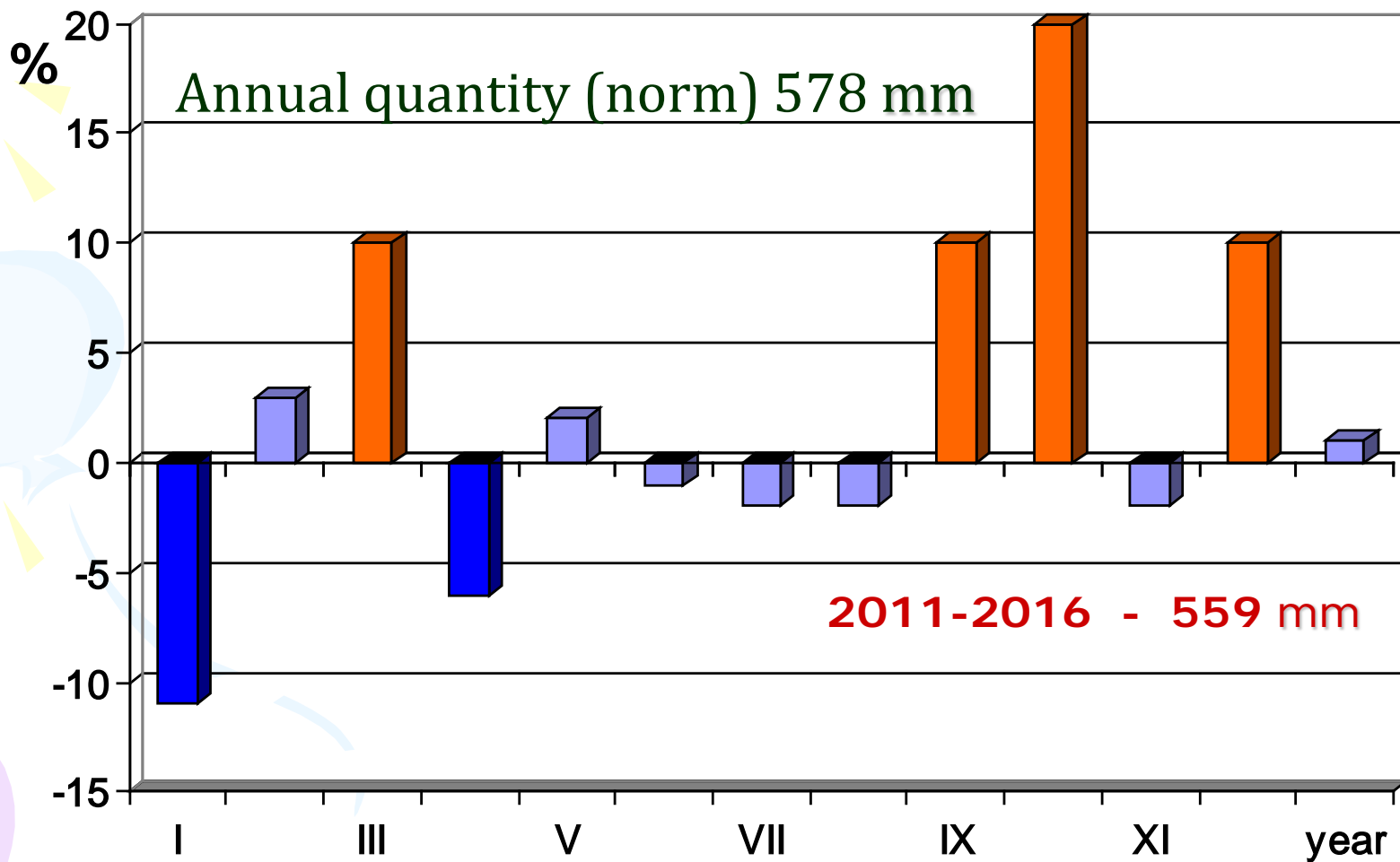
Blue - 1986-2005

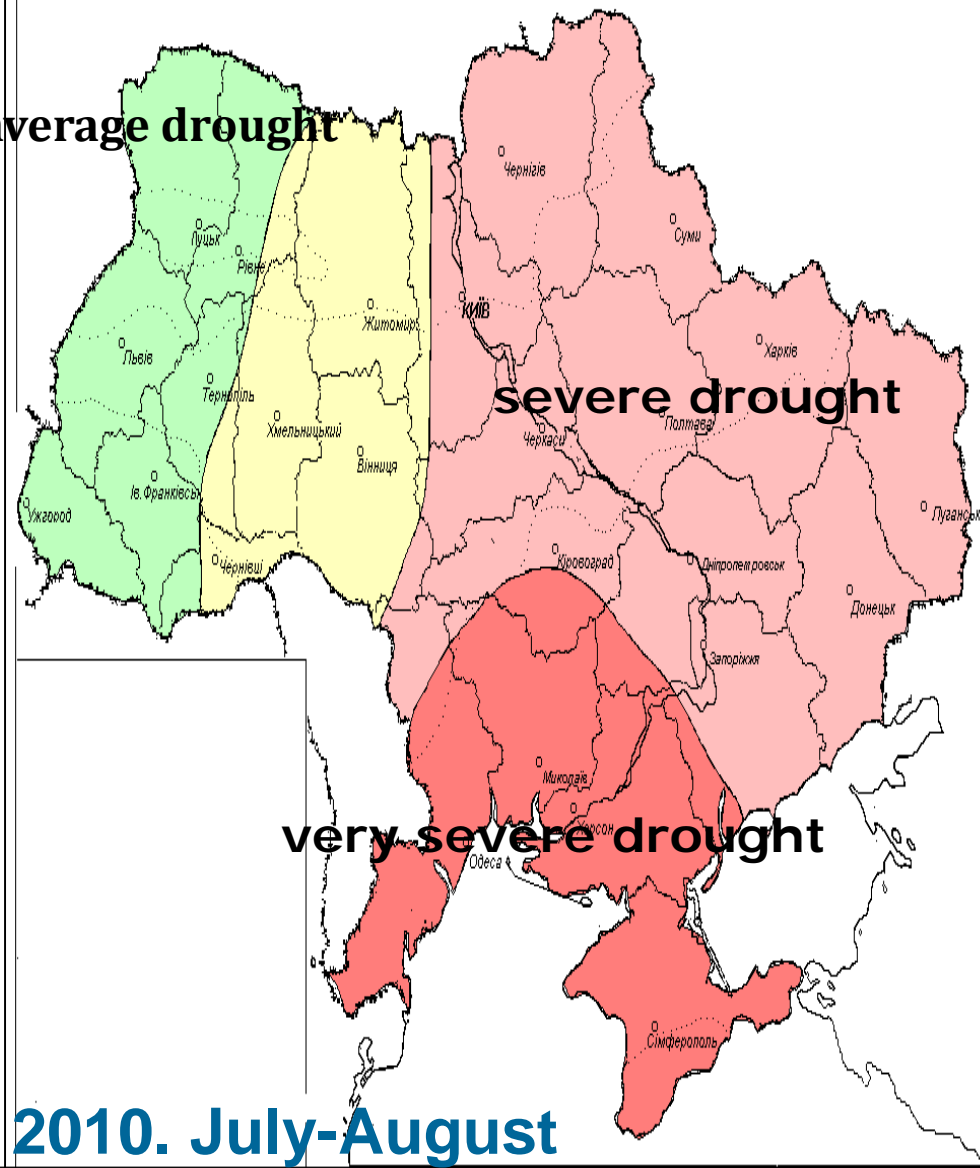
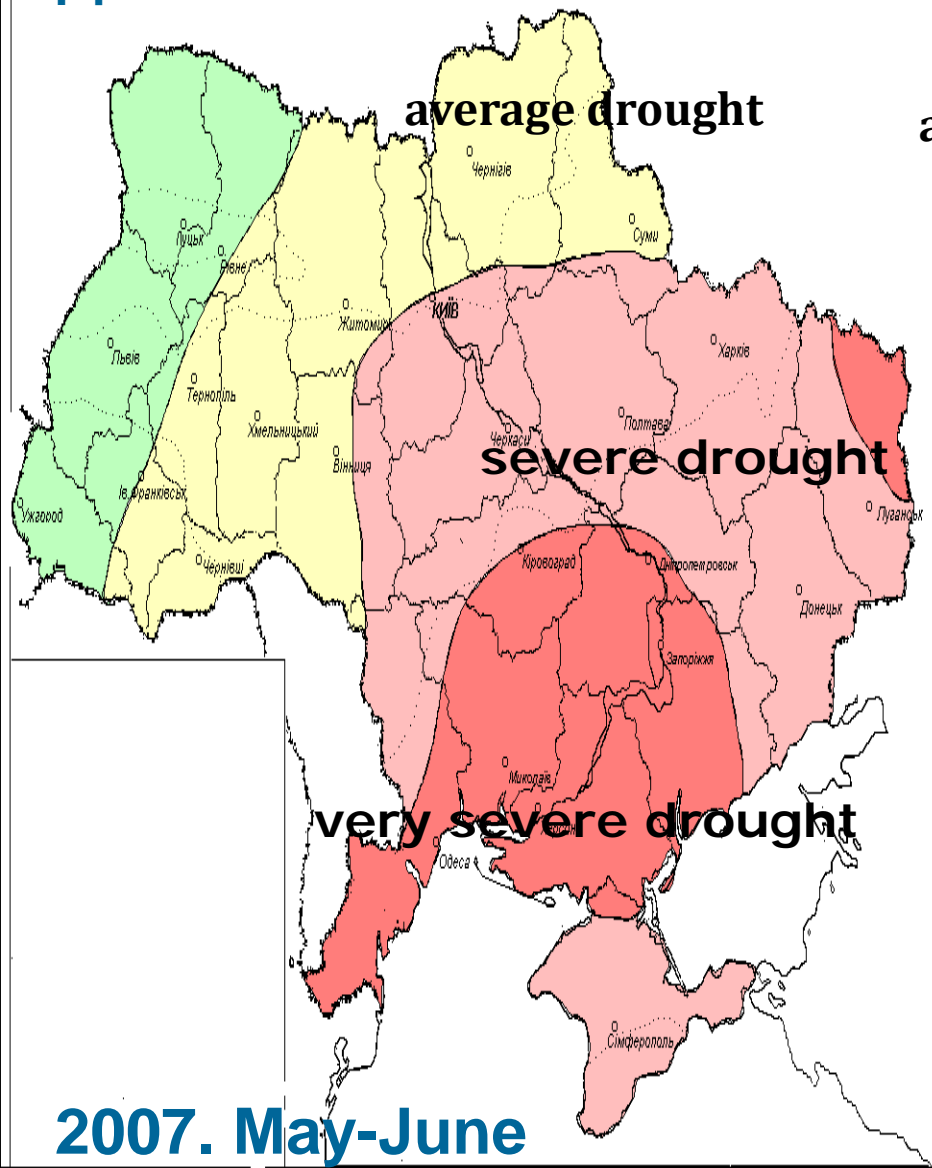
Red 2006-2016

12. Increasing the number of days with heat stress compared with the period 1986-2005 in the period 2006-2015



13. Changes in rainfall for the period 1991-2016 by month (% of the norm 1961-1990)

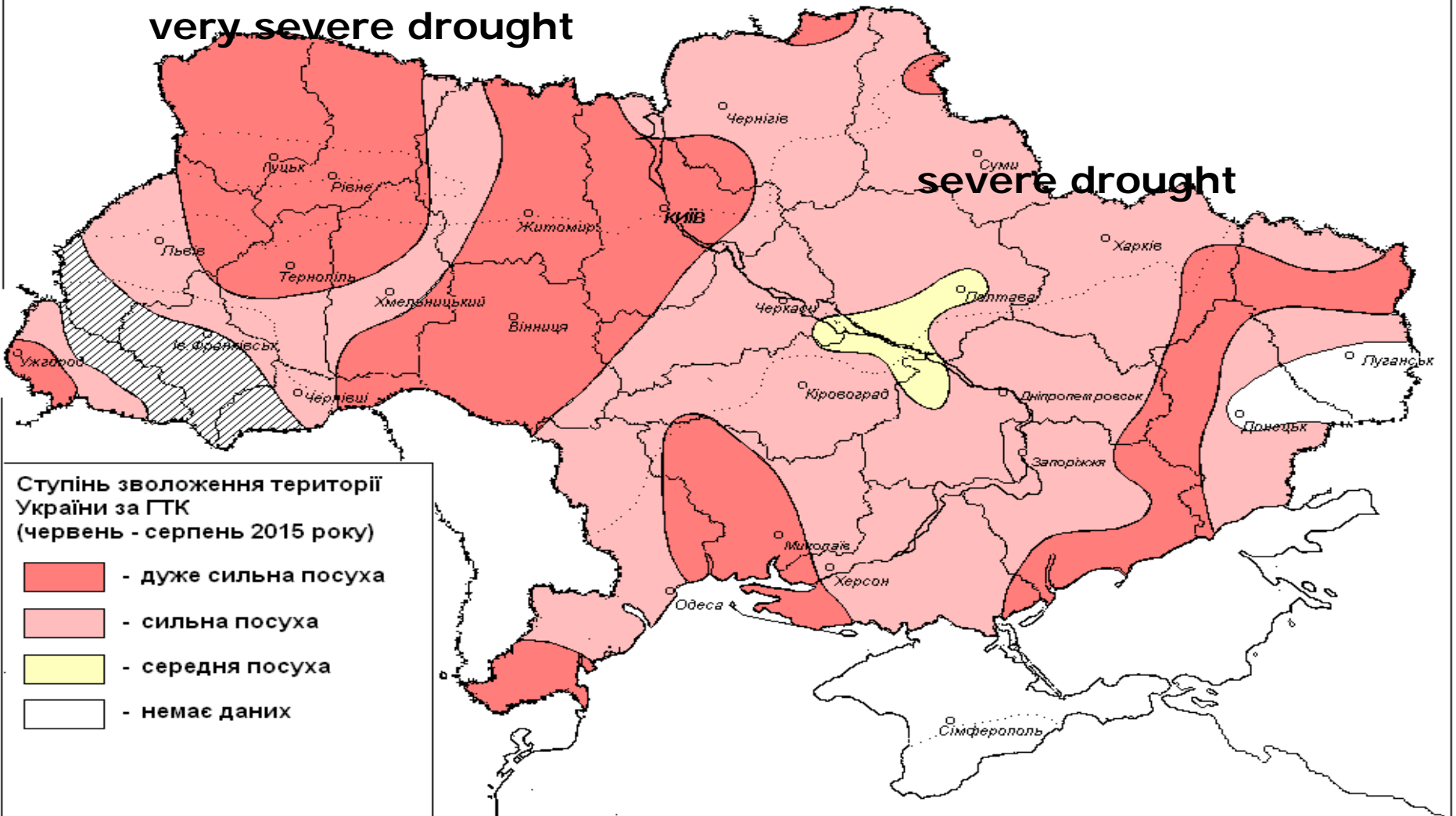




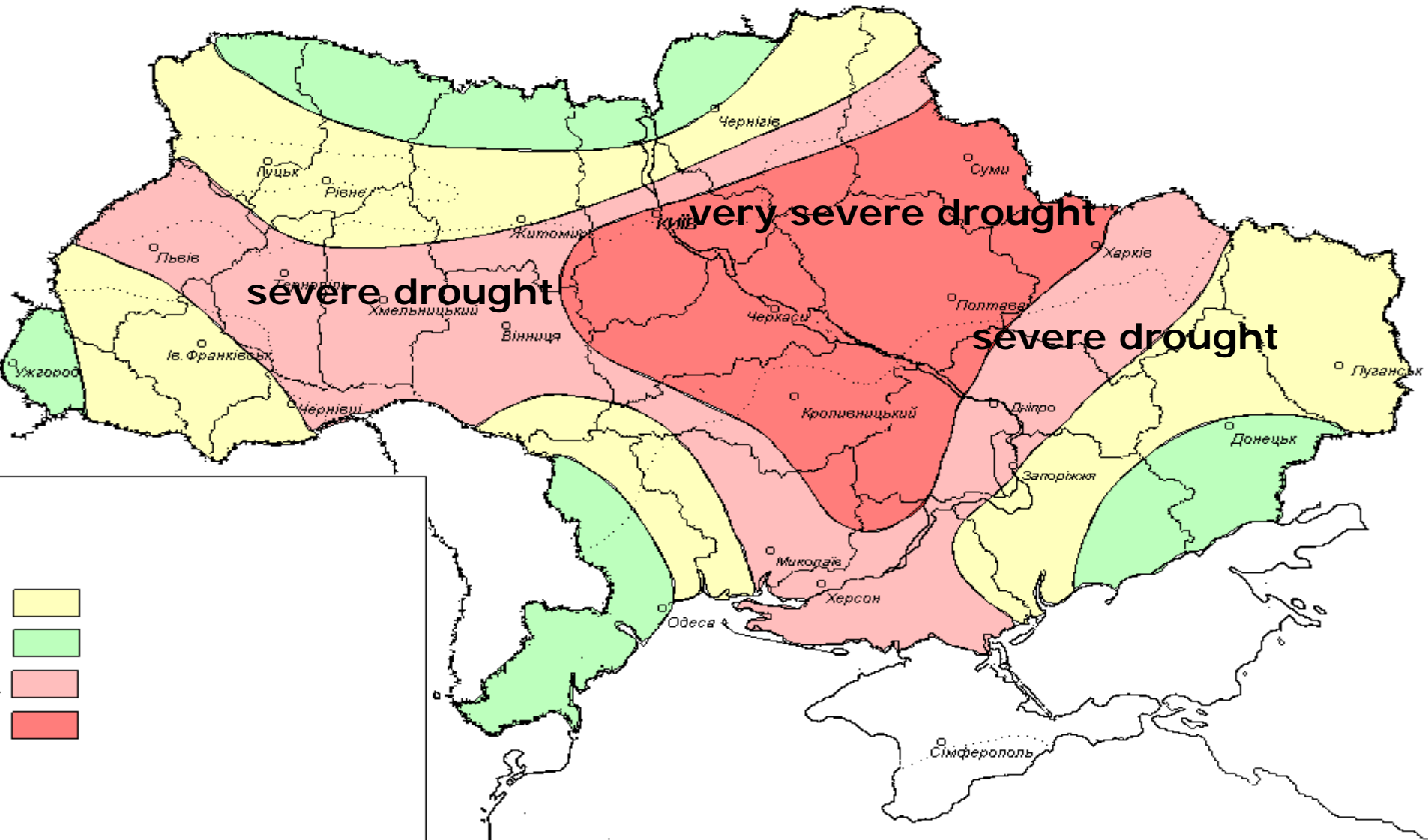
15.Drought 2015. June-August

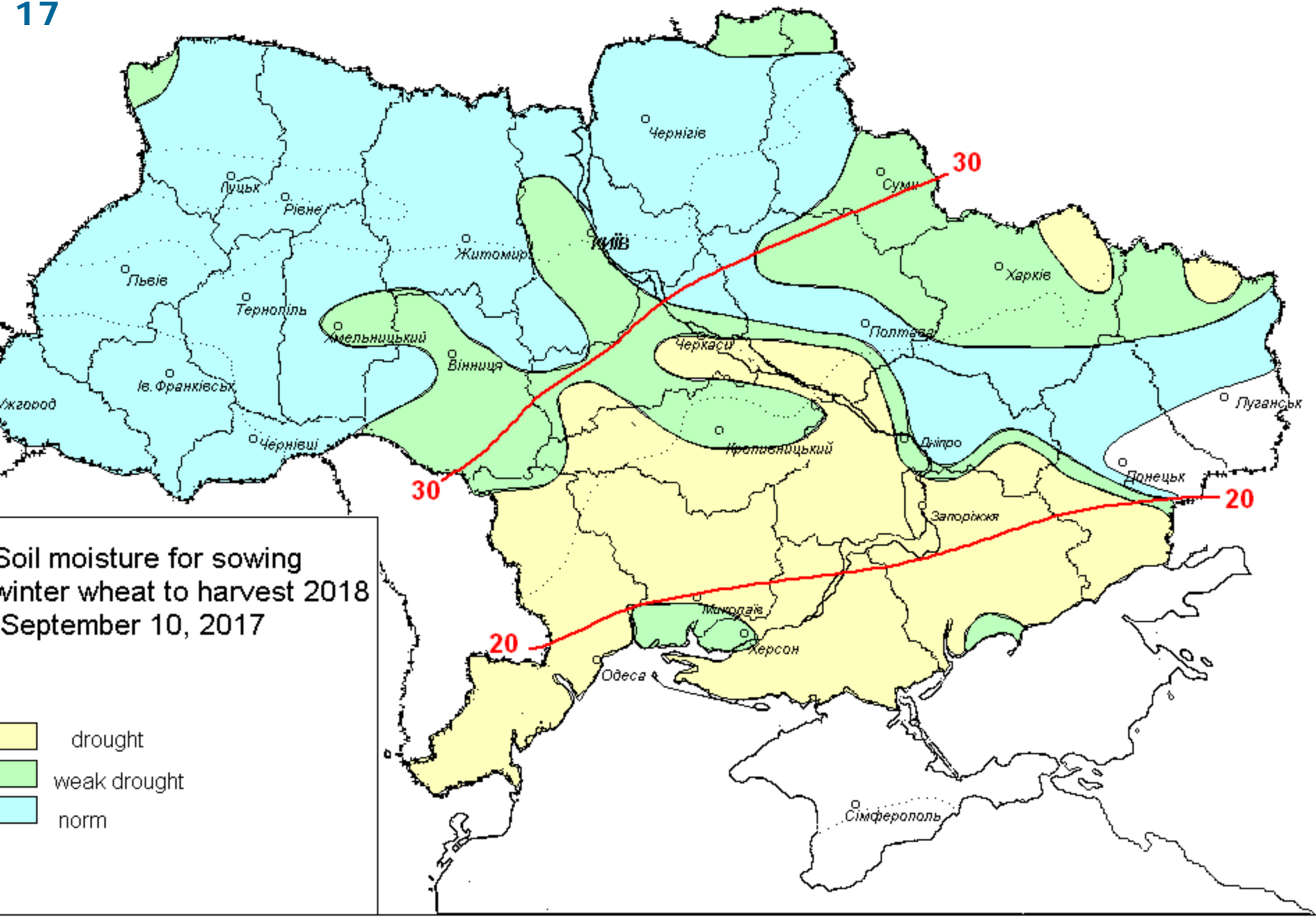
very severe drought

severe drought

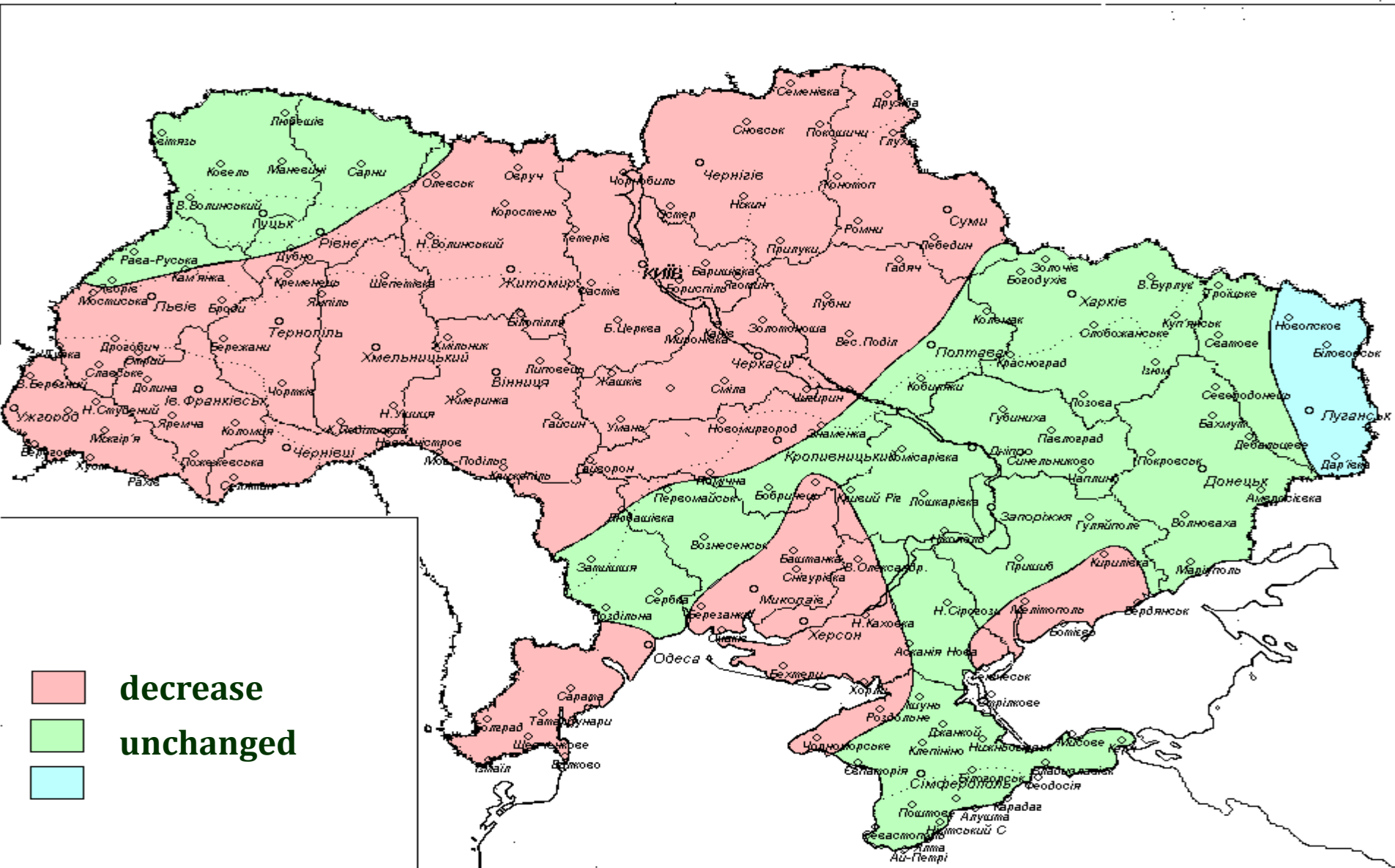


16.Drought 2017. June-August





18. The change in the humidity of the climate in 1991-2016 compared with 1961-1990. May- June (Selyaninov coefficient)





Thank you!!!

Vielen Dank !!!