

7th Study Conference on BALTEX
Borgholm, Island of Öland, Sweden, 10 to 14 June 2013

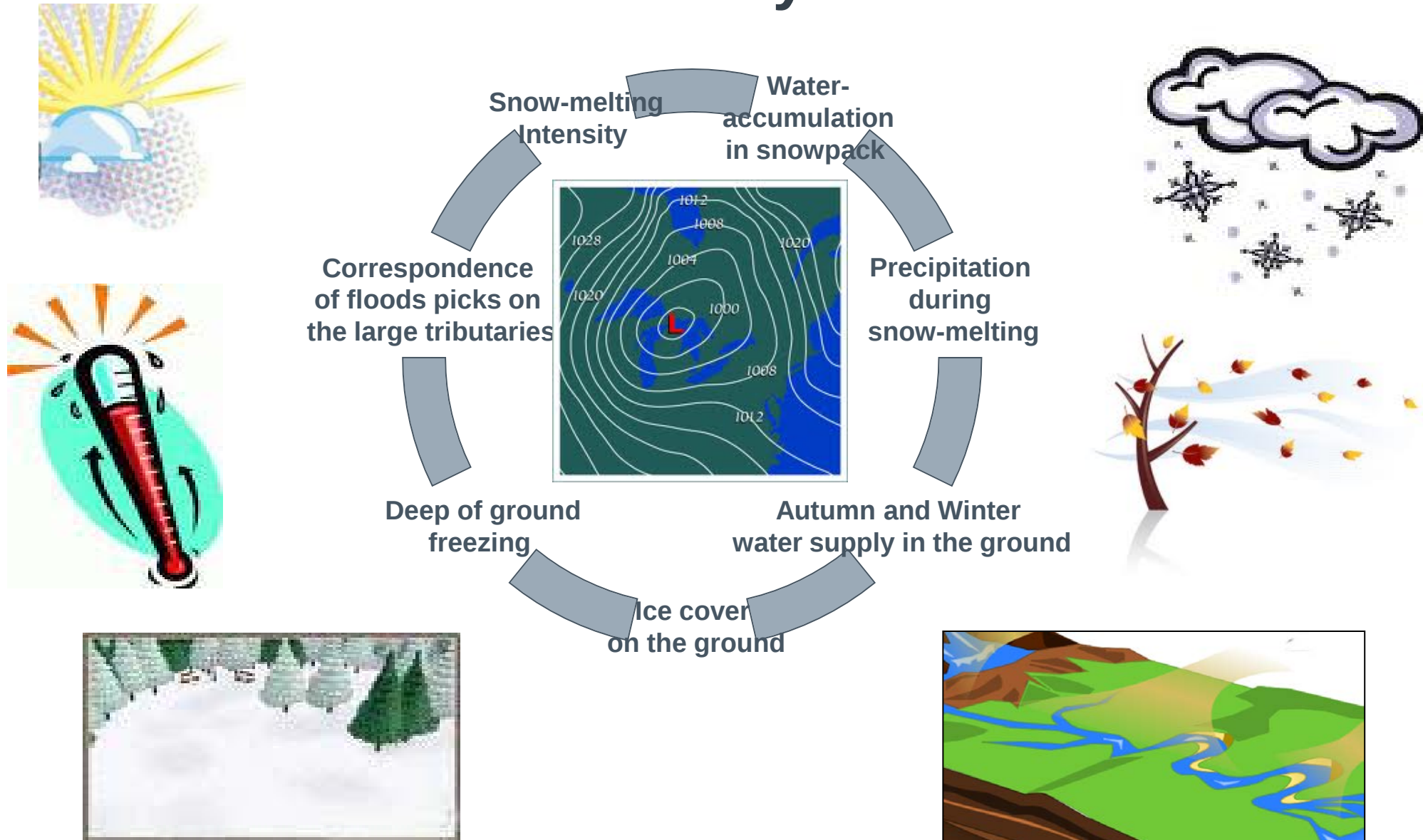
Flood Frequency on the Rivers in the Belorussian Part of the Baltic Sea Basin and Cyclonic Activity

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Factors, which influence on the spring floods for the territory of Belarus



Data and methods

Institute of Oceanology Extratropical cyclone tracks for 1948-2007

(obtained from NCEP/NCAR reanalysis data <http://www.cdc.noaa.gov/cdc/data.ncep.reanalysis.html>)

Every track is written in the following way:

2-Jan-2007 06:00

8

290.0 82.5 6 999.8

290.0 82.5 7 997.6

284.0 82.1 8 995.4

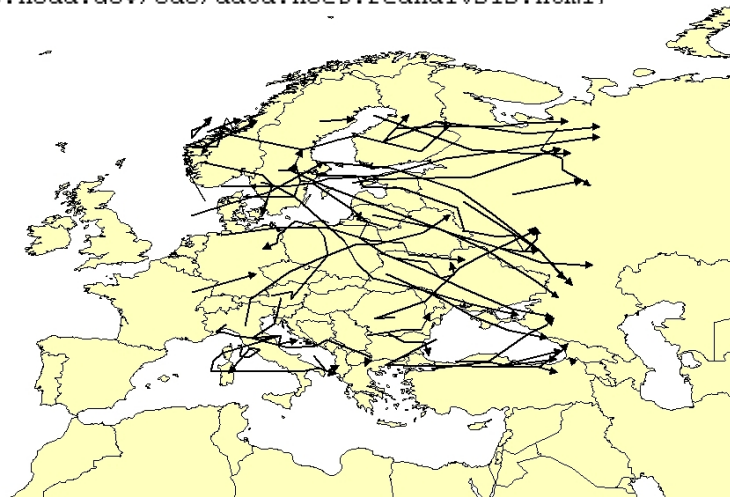
306.9 83.6 9 991.4

305.5 84.5 10 990.7

310.6 84.1 11 989.6

326.3 85.4 12 990.5

326.3 85.4 13 991.1



" 2-Jan-2007 06:00" - time when the first point of cyclone track has been identified

" 8" - number of points in the track (6 hr step)

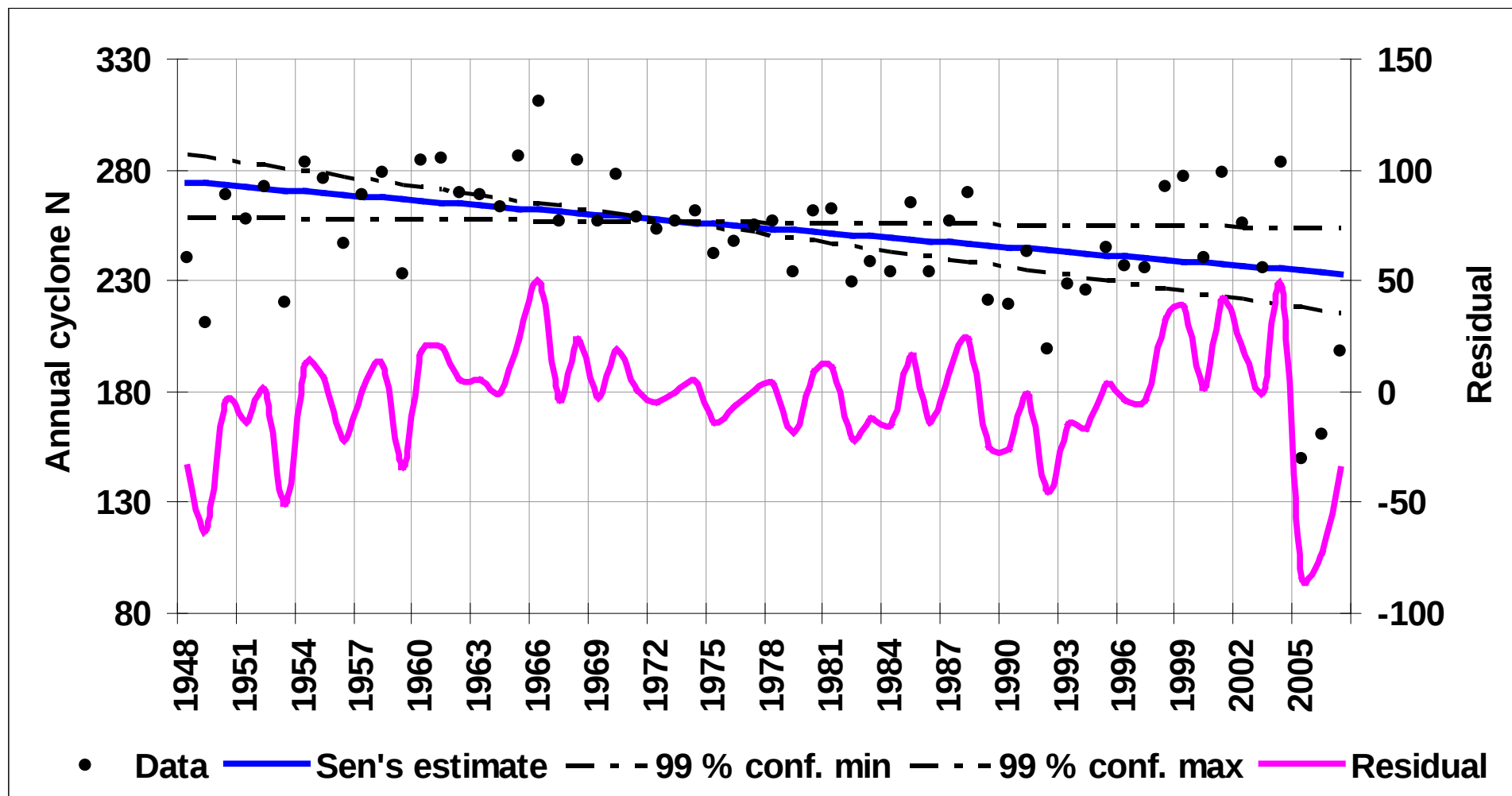
" 290.0 82.5 6 999.8" - longitude, latitude of cyclone centre, time*, SLP at cyclone centre
at first point of the track

" 290.0 82.5 7 997.6" - the same but for the second point of the track

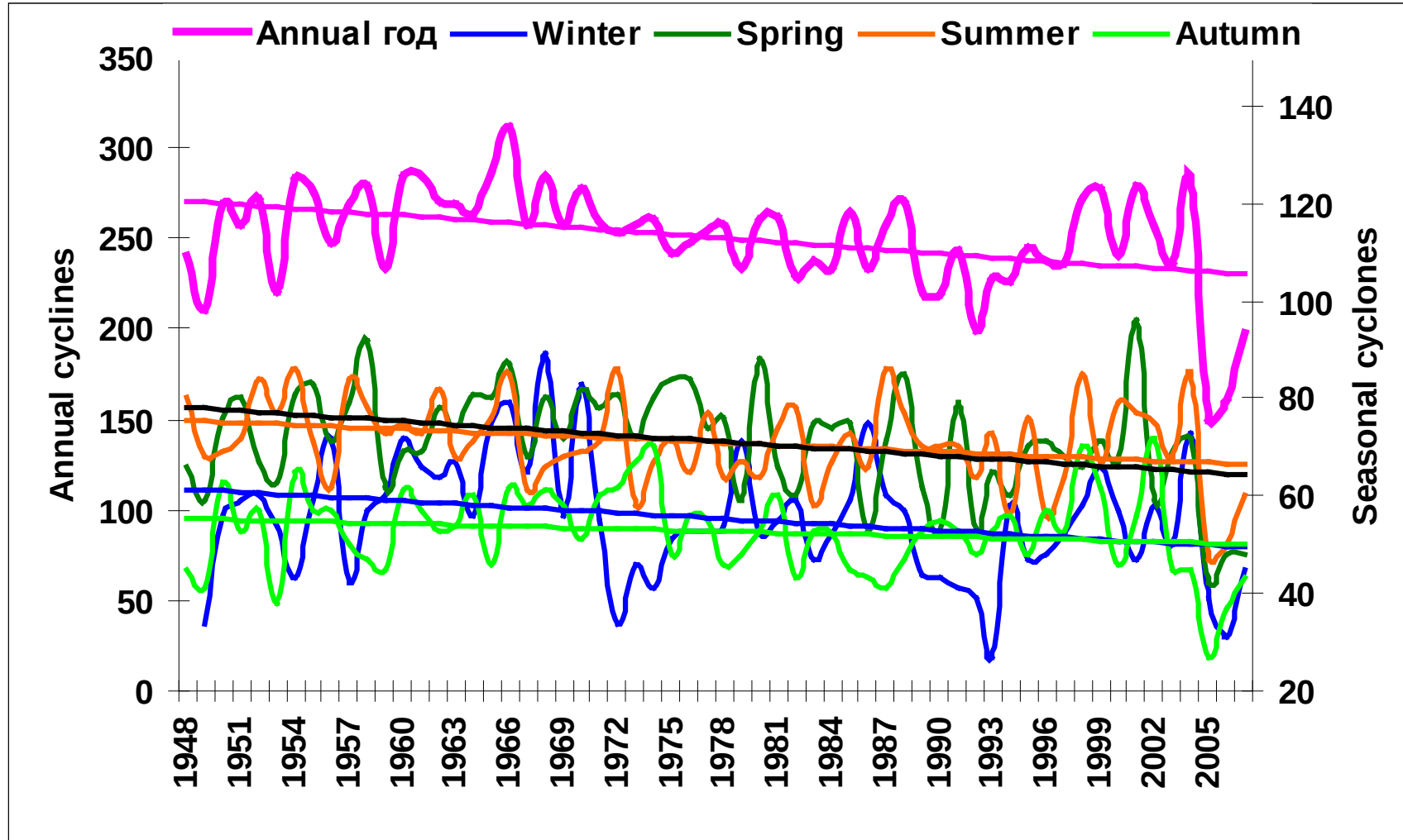
...

" 326.3 85.4 13 991.1" - the same but for the last point of the track

Dynamics of cyclones in the domain 20-65° N and 5-45° E (results of Mann-Kendall Trend Test)



Cyclones frequency by seasons in the domain 20-65° N and 5-45° E

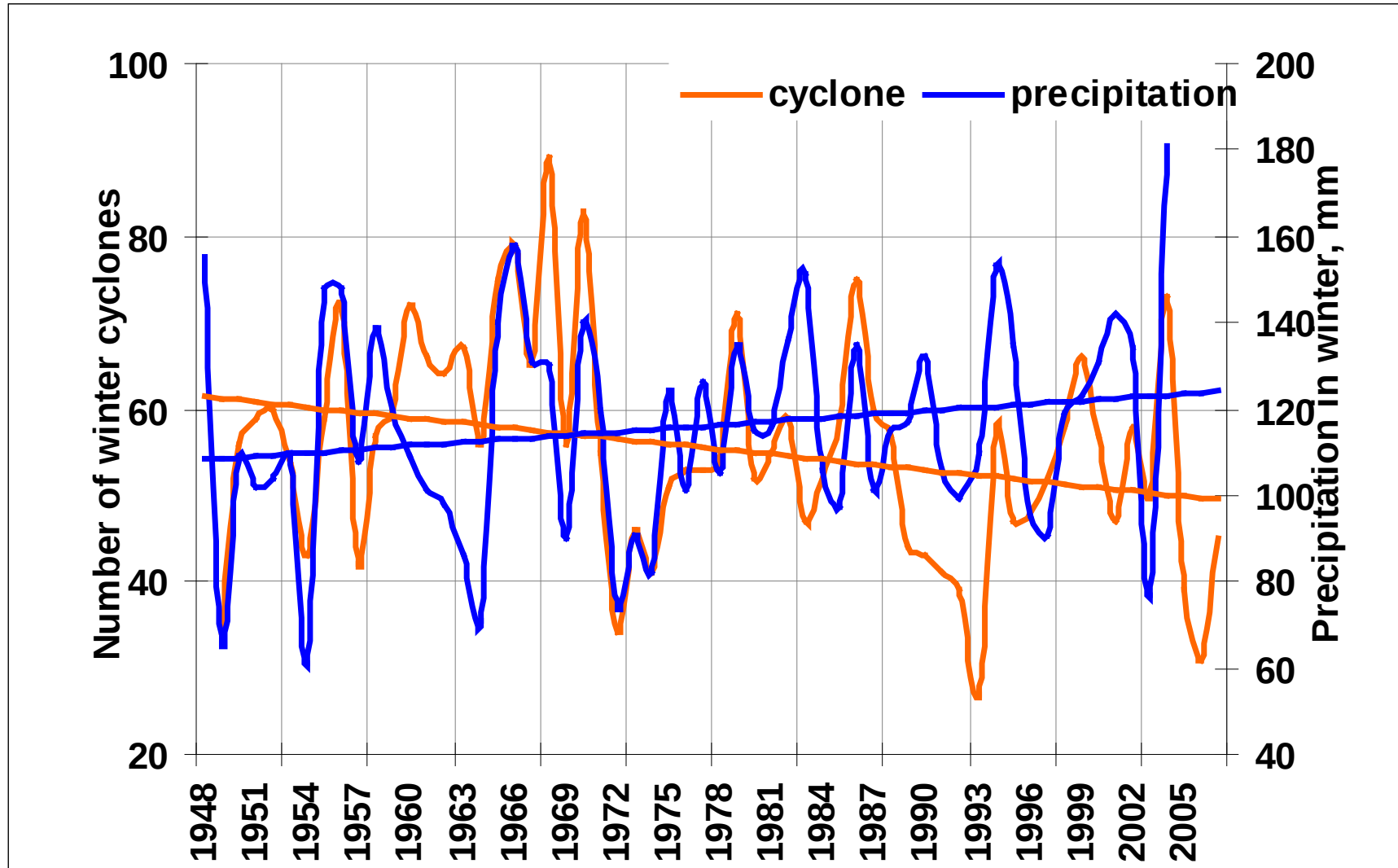


Cyclones distribution by decades and seasons

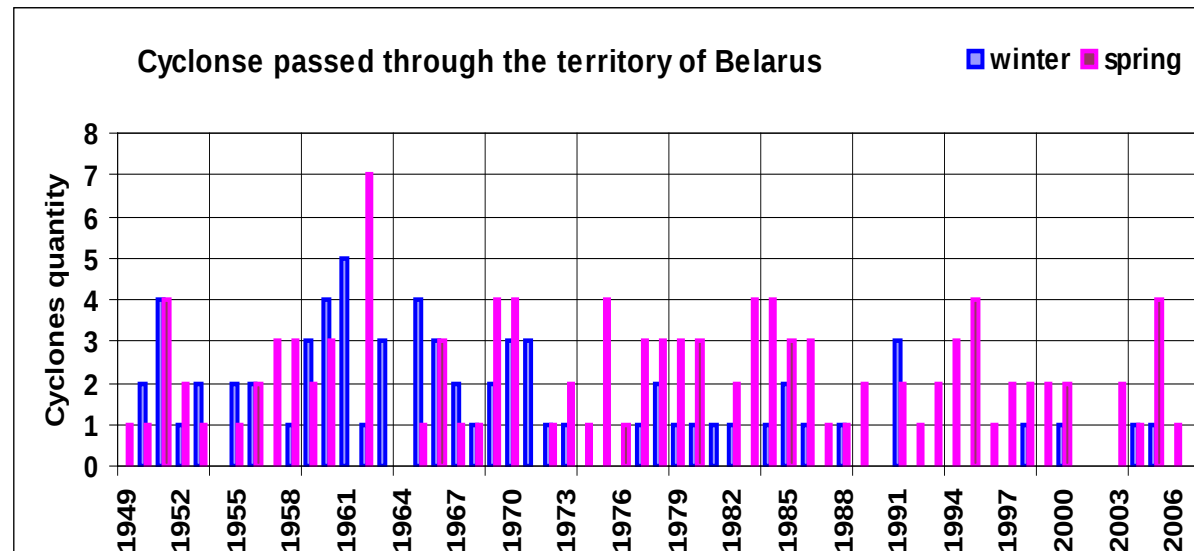
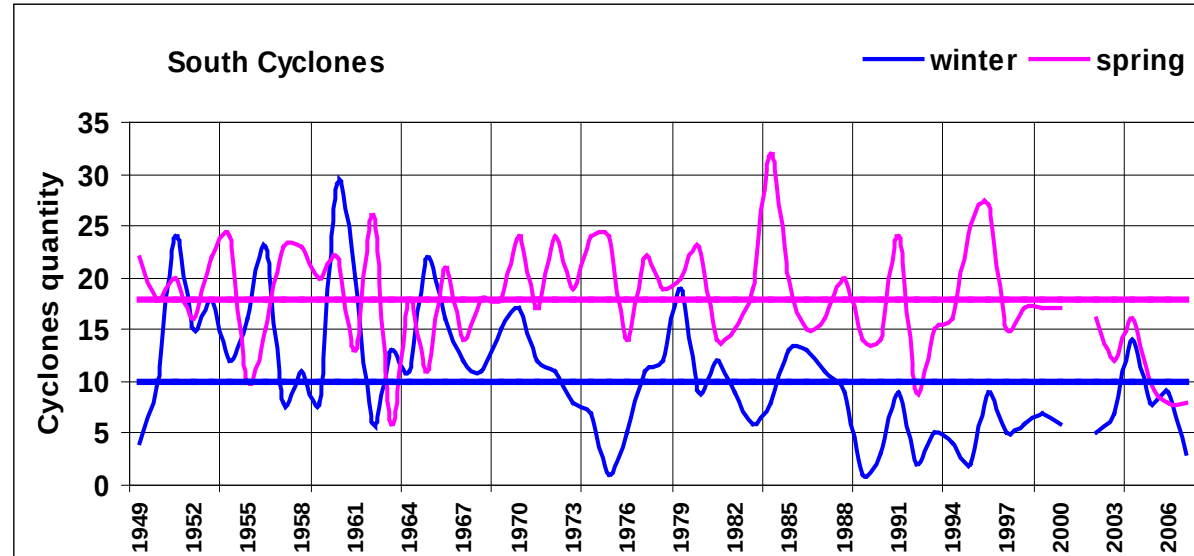
Period	Annual	Winter	Spring	Summer	Autumn
1950-1959	261*	56	75*	76*	53
1960-1969	277*	69*	76*	73	57*
1970-1979	254*	54	77*	70	56
1980-1989	247*	56	71	71	49*
1990-1999	238*	48*	66*	68	56
2000-2007	225*	50*	63*	68*	46*
1948-2007	250	55	71	71	53

* $P < 0.1$

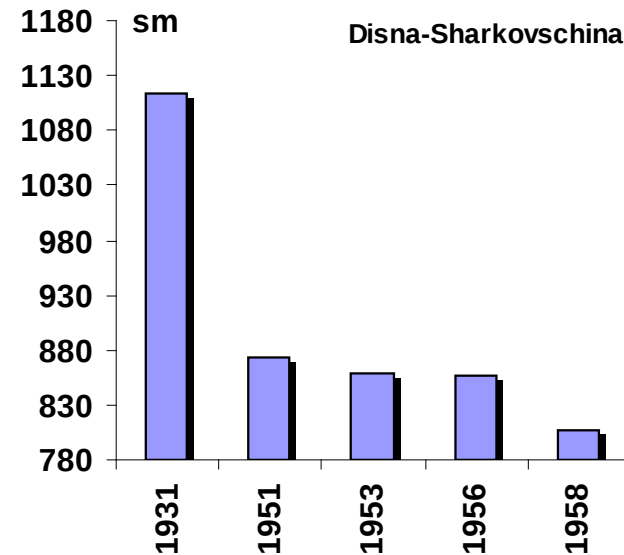
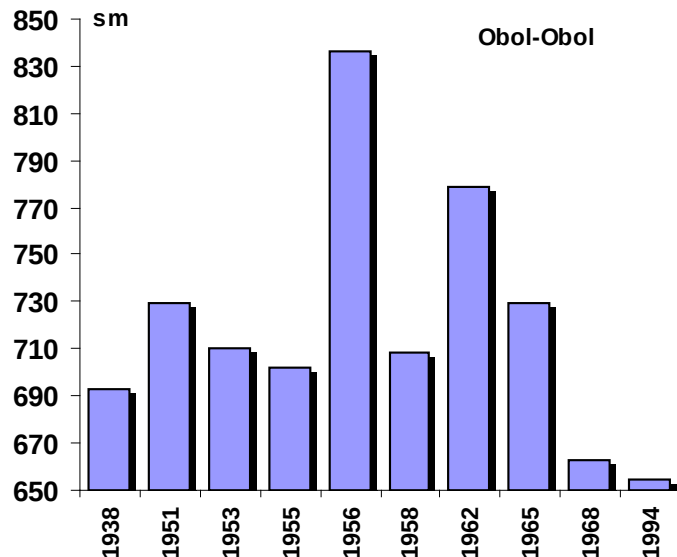
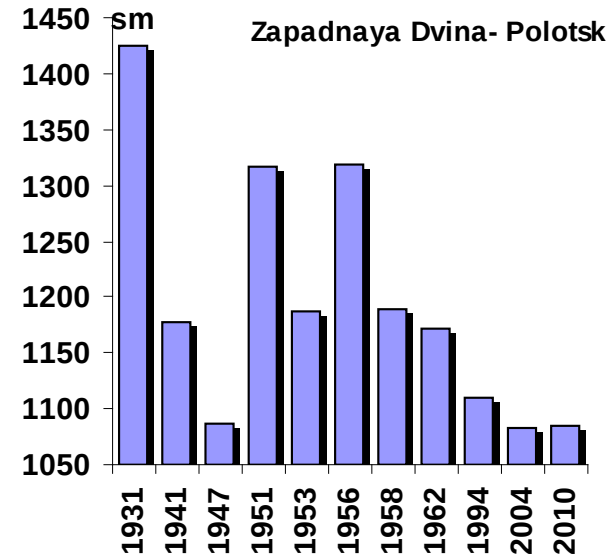
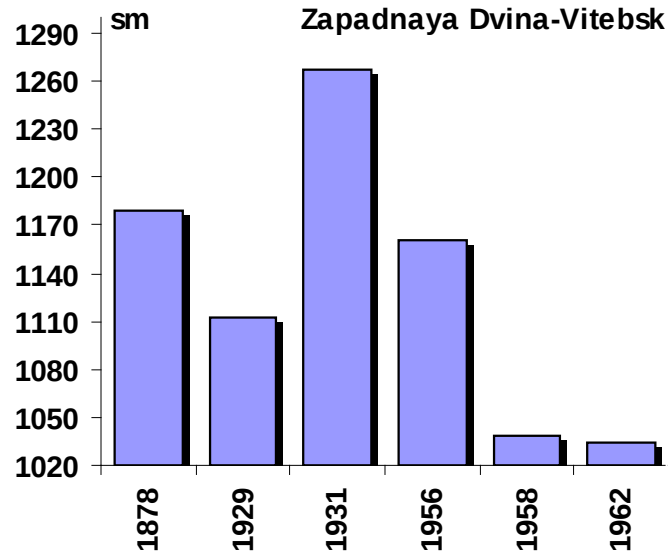
Dynamics of cyclones and precipitation in winter (December through February)



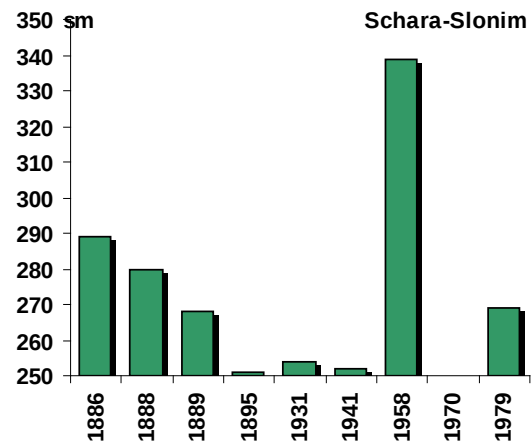
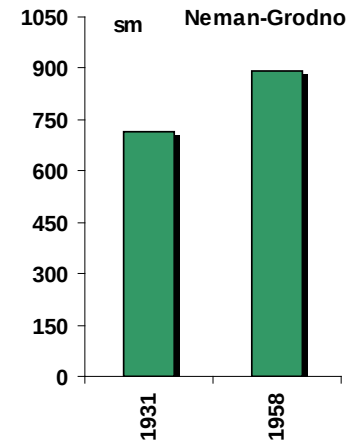
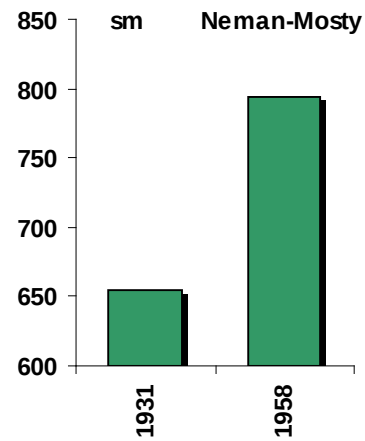
South cyclones and Cyclone passed through Belarus



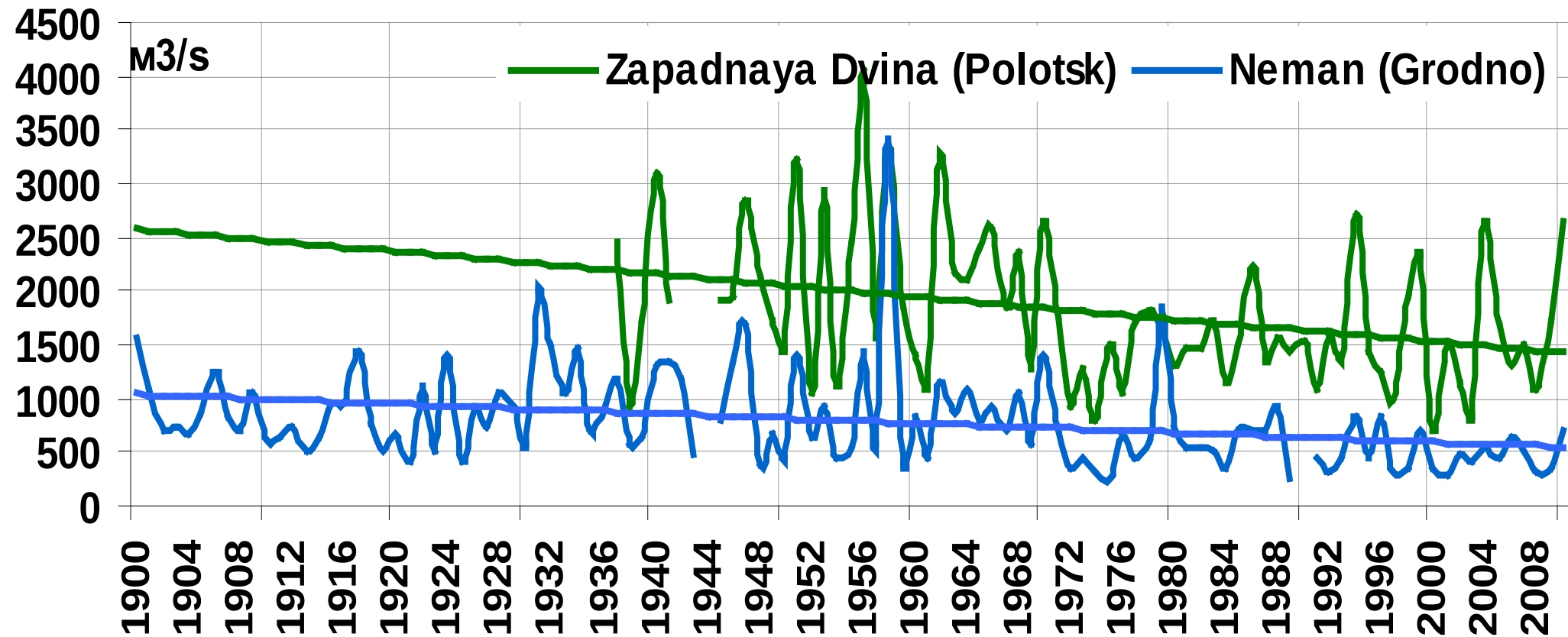
Floods frequency (stage exceeding the dangerous marks and deviations from these marks) in the Zapadnaya Dvina basin



Floods frequency (stage exceeding the dangerous marks and deviations from these marks) in the Neman and Zapadny Bug basin



Maximum discharge during spring floods on two major rivers in the Belorussian part of the Baltic Sea Basin



Cyclones trajectories 01.01-30.04.1956

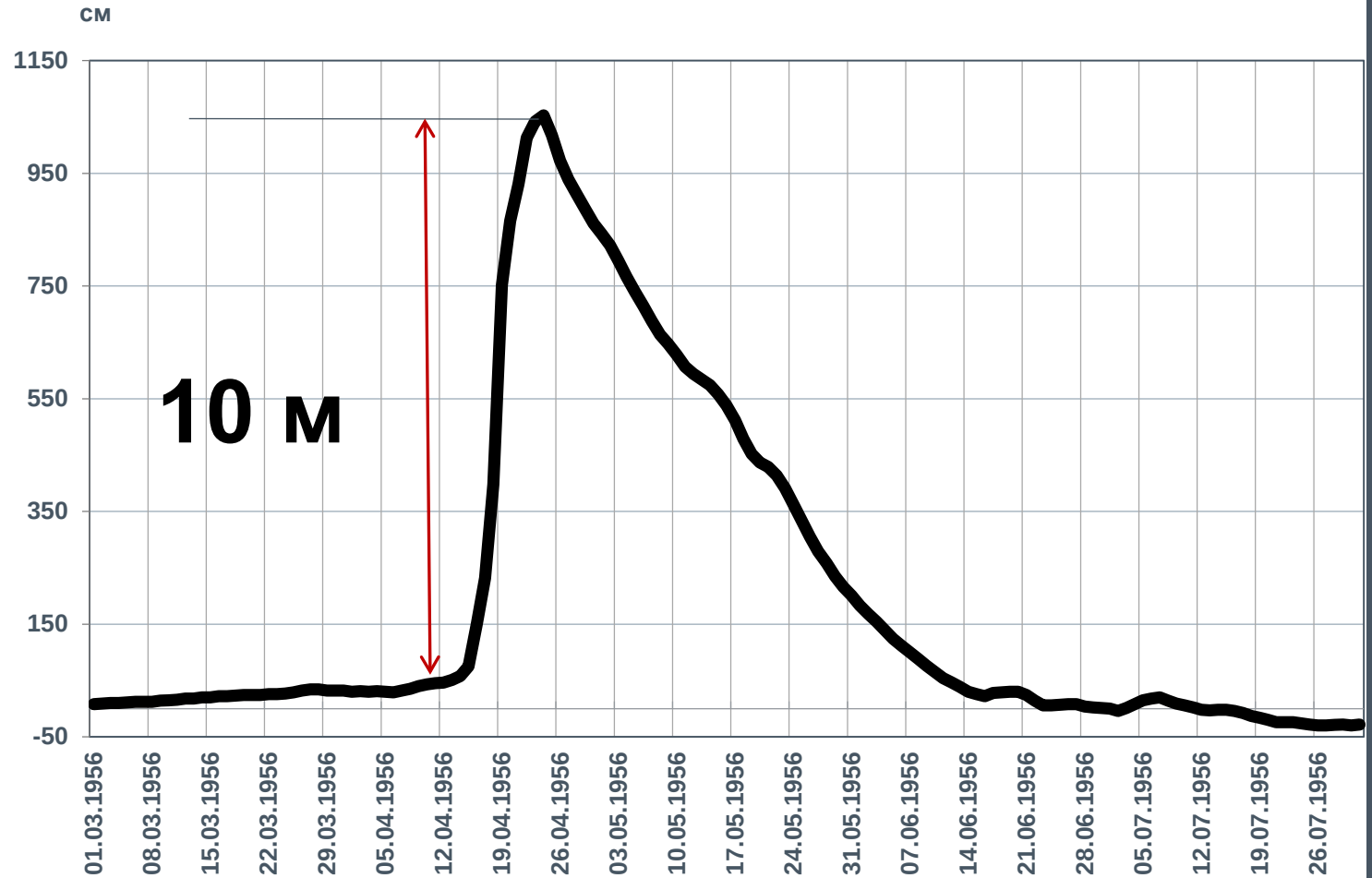


Zapadnaya Dvina, 1956.

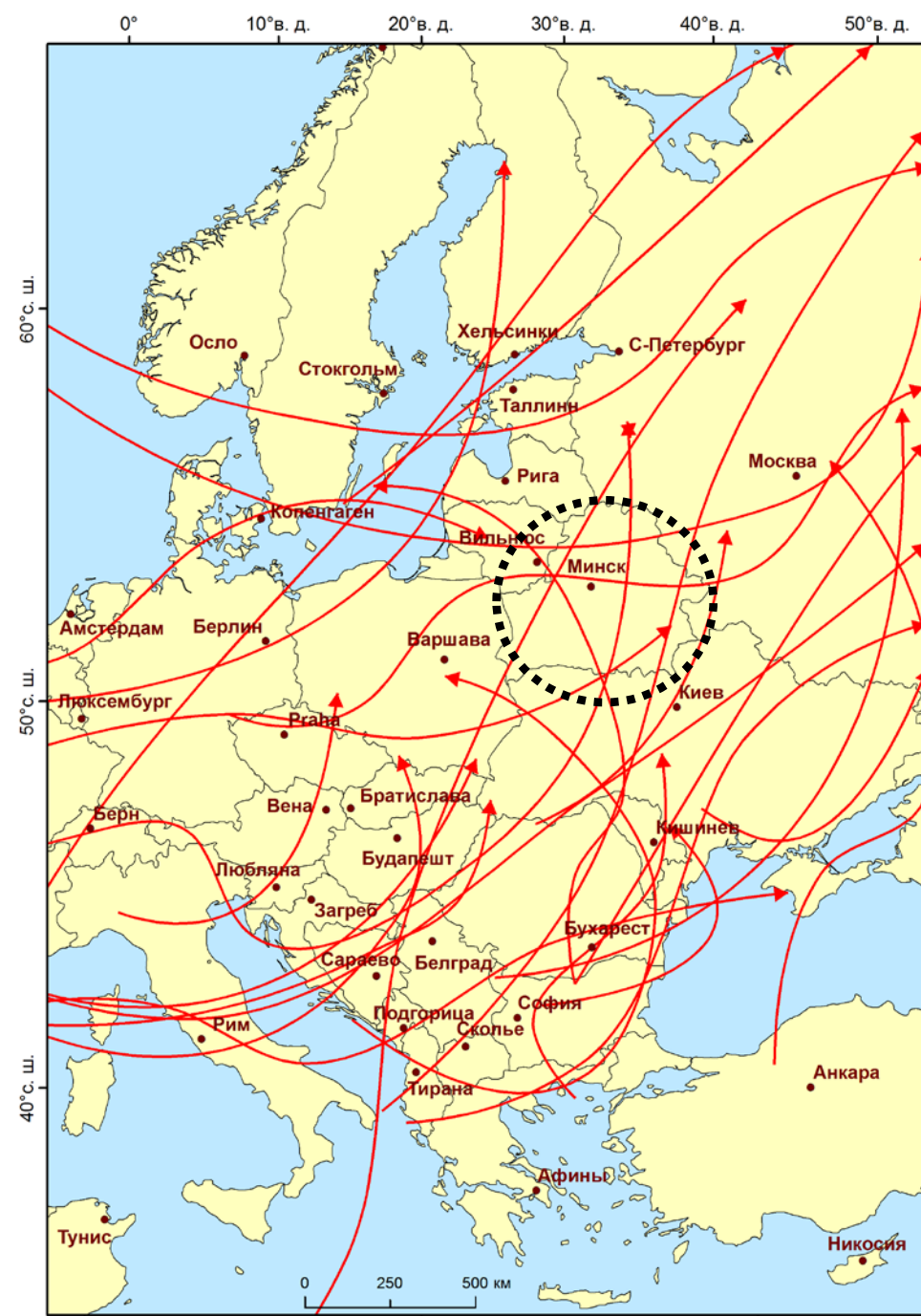
Significant precipitation and deep freeze of ground;

Water supply in snowpack - 120-150 % of average;

Frequent thaws caused ice cover on the ground with deep 1-2 sm.



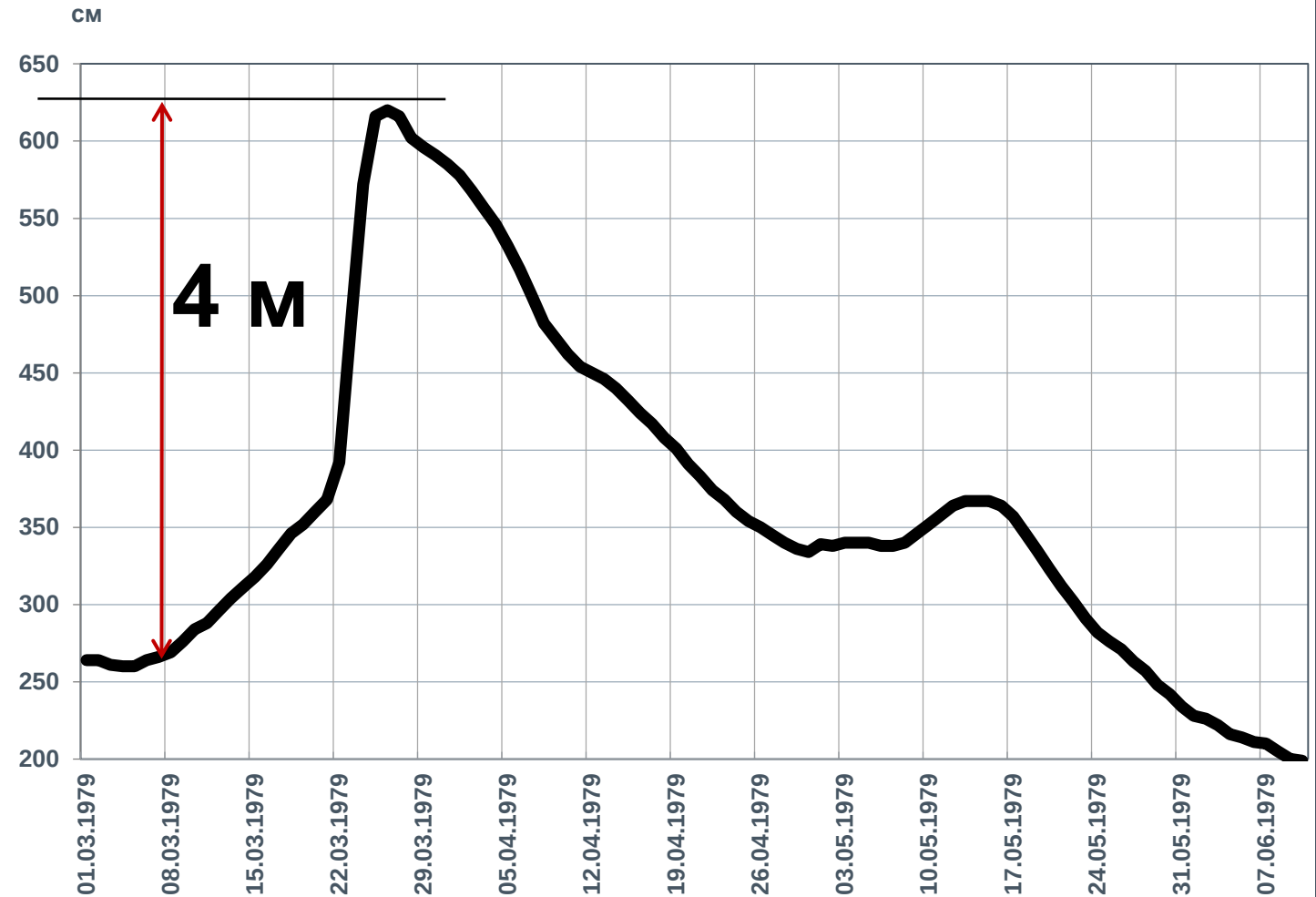
Cyclones trajectories 01.01-30.04.1979



Zapadny Bug, 1979.

Correspondences of floods picks in different parts of the basin;

Deep ice cover on the rivers (38-40 cm) – ice breaking and jams;



Thank you for attention!