



### Basin characteristics

River Basin / River Basin (according EU-WFD)

Operation (from... to...)

Since 1947, still in operation

Gauge coordinates / Gauge datum:

30,97 °E; 49,65 °N

Catchment area:

70.3 km<sup>2</sup>

Elevation range:

130-219.1 m a.m.s.l.

Basin type:  
(alpine, mountainous, lowland)

Lowland

Climatic parameters:  
(mean precipitation, temperature and others)

537 mm (1949-1986), 7.0 °C (1949-1986)

Land use:

7 % Wood, 3 % meadow, 74% ploughed field, 16% settlement

Soils:

Podsolich chernozems and gray timbers

Geology:

Sandstones, wood and marl loams, granites

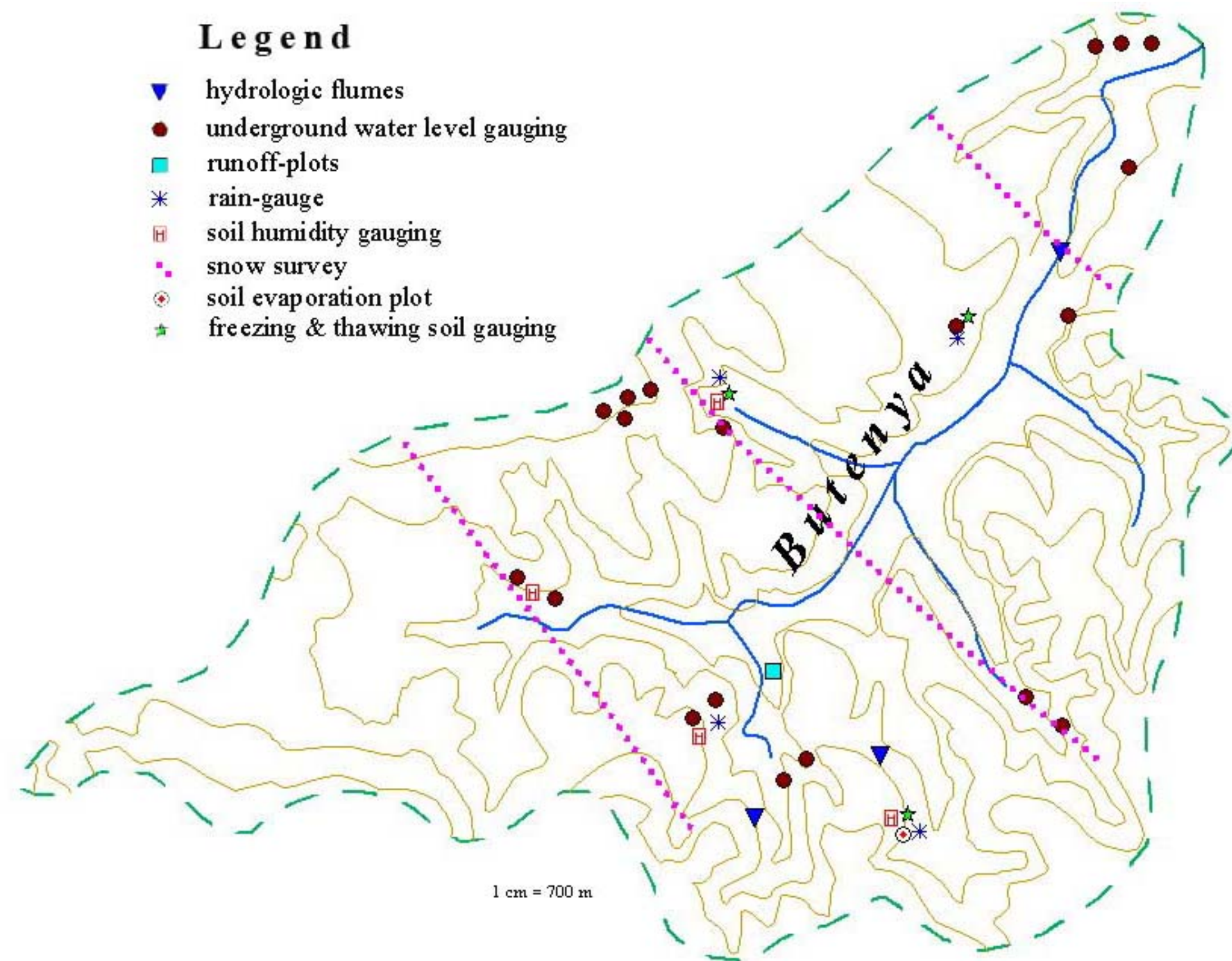
Hydrogeology:  
(Type of aquifers, hydraulic conductivity)

Upper aquifer in lower layers of water-glacial sands, the main aquifer - in sands of poltavski tier and in the rifts of crystalline rocks

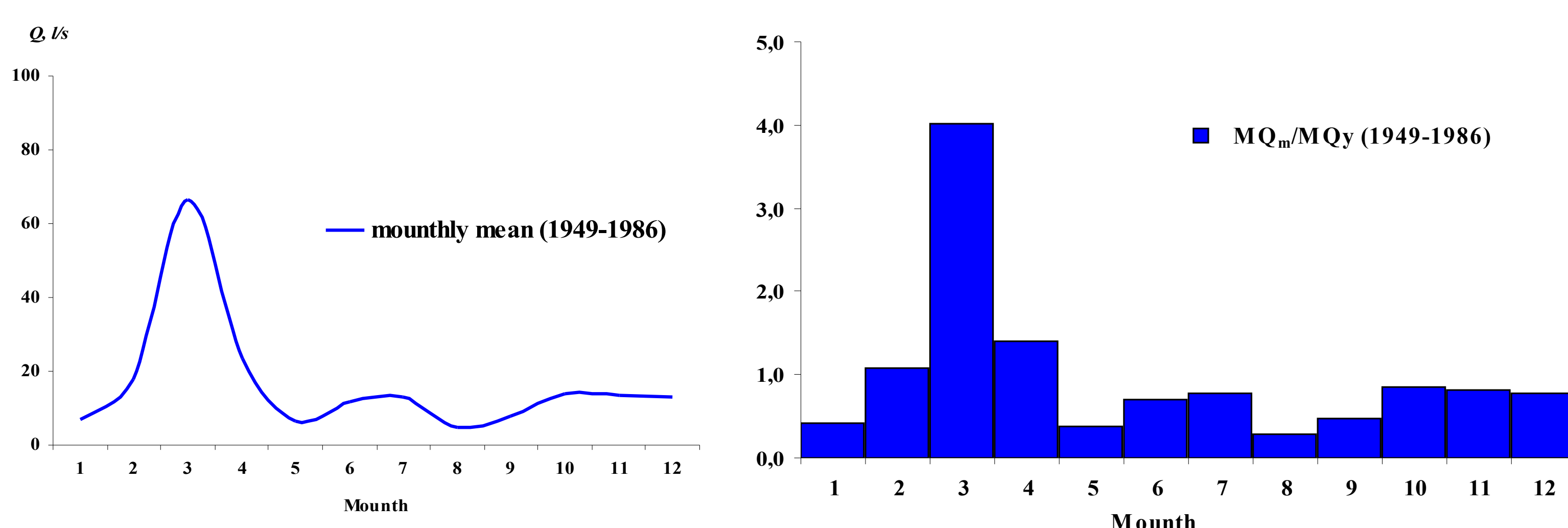
Characteristic water discharges:  
( $Q_{min}$ ,  $Q_{max}$ ,  $Q_{mean}$ )

16.6 l/s ( $Q_{mean}$ , 1949-1986)

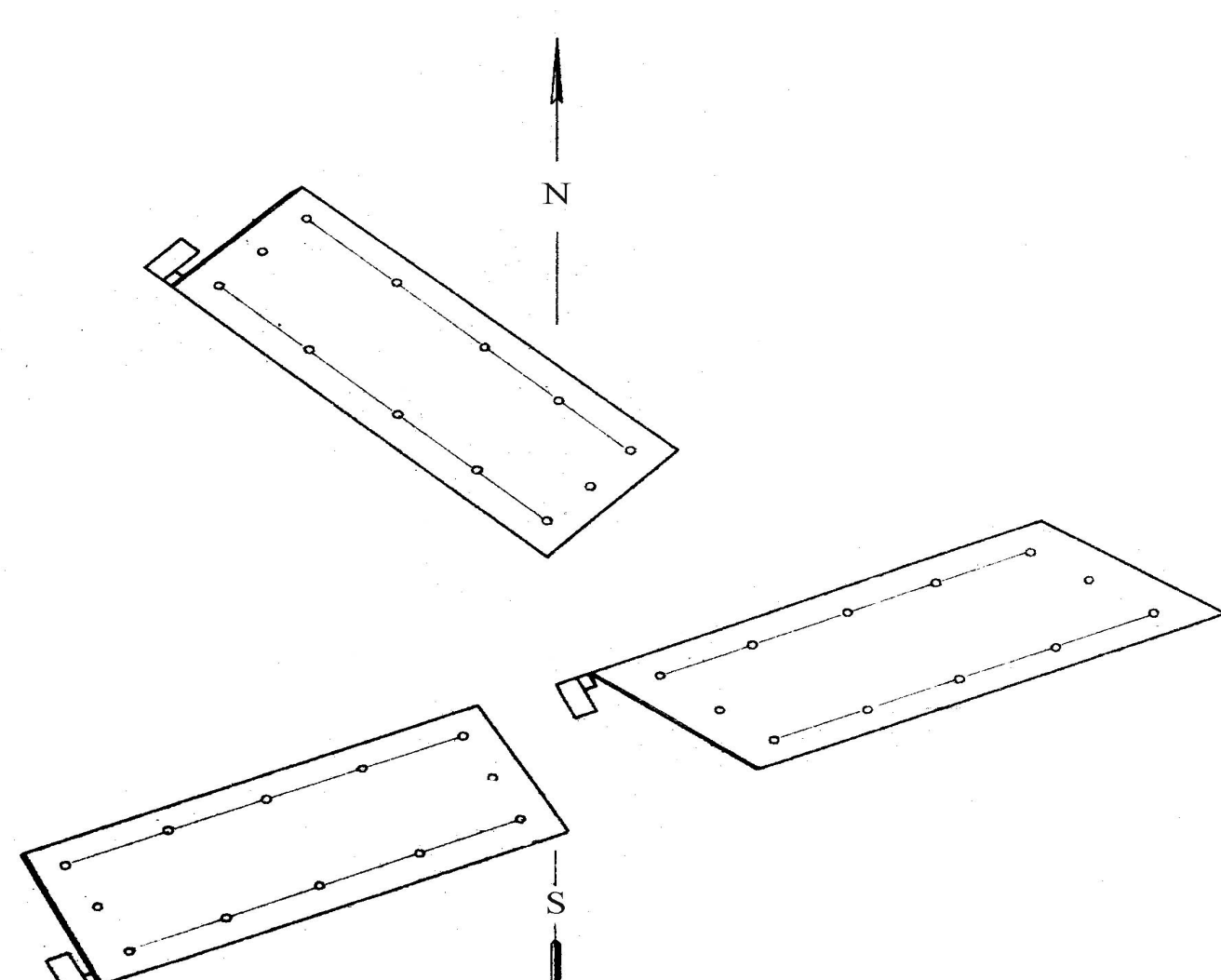
### Map of the research basin



### Mean hydrograph / Pardé flow regime



### Special basin characteristics (hydrogeology, lakes, reservoirs etc.)



Scheme the runoff-plots in the basin of the Butenya river

### Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
Runoff	1949 – 1986 cont. 1986 – incont.	Grapher 2 time in month (since 1976)	3
Surface flow	1949 – cont.	Daily	2 – 6
Water level	1949 – cont.	Daily at 8 & 20 h	3
Precipitation	1949 – cont.	Daily at 9 & 21 h	8 – 17
Underground water level	1948 – 1986	5 & 10 time in month	7 – 30
Air temp., humidity, wind	1949 – cont. 1955 – cont.	8 time in day	1
Soil humidity	1949 – 1986	3 time in month	6-12
Soil evaporation	1948 – 1986	Daily (May-Nov)	1

### Applied models

1. Balance methods
2. GIS PCRaster

### Main scientific results

1. The information about the conditions of the forming of the maximum, minimum, seasonal and mean annual runoff from the small catchments areas of the forest and steppe zones of Ukraine were received.
2. The significant influence of the local factors on forming the values of the runoff on small river basins was revealed.
3. The results of the observations for the humidity and the waters equivalent in snow and ground-soil on the forest and steppe catchments showed the differences in the supply of water on the different forms of the relief, the irregularity of the distribution of the waters on the catchments.
4. The methods of the calculation of the supply of the productive water in the surface layer of the ground and the intensities of the water yield from the snow were also designed.
5. The supplies of the water in the underlying surface of forest were calculated. It allowed to revising the forming of the water balance on the small river basins.
6. The conditions of the forming of the maximum discharges were researched, the structure and the determination of the parameters of the limiting intensity formula for the conditions when the characteristics of the declivity of the small catchments area the vastly differ the other from the other were revised.
7. The research of the processes of the sorption of water in the soil, of the infiltration abilities the different ground-soils, the detentions of water in the soil and the determinations of the general losses depending on the preceding conditions, of the processes the water erosion were carried out the experimental researches in the conditions of the experimental sprinkling of the runoff-plots.
8. The experimental studies of the migration of the radioactive substances after the Chernobyl accident were made. It was allowed to improve and develop the complex of the methods for the estimation of the structure and dynamics of dissolved in water Caesium-137 removing with water runoff
9. The antierosoin stability of the soil in the Butenya river basin with the using of the experimental sprinkling method and the GIS-technology also was researched.

### Key references for the basin

1. Gorbachova, L.O. (2005) The factors, structure and dynamics of dissolved in water Caesium-137 removing with water runoff in Prypyat river basin. Ph.D. Thesis, Taras Shevchenko Kiev national university, Kiev, Ukraine. (in Ukraine).
2. Svetlitchnyi, A.A., Shvebs, G.I., Plotnitskyi, S.V., Kugut, V.F., Stepovaya, O.I. (2002) The problems of the estimation and space modeling of the characteristics the antierosoin property of the soil of the forest. *Proceeding of UHMI*, Vol. 250, 162-178. (in Russian).
3. Vetrov, V.A., Alekseenko V.A., Poslovina, A.L., Cheremisinov, A.A., Nikitin, A.I., Bovkun, L.A. (1990) The use Caesium-134 the Chernobyl for the research the removing the atmospheric admixture with of the natural basins. *Water Resources*, Moscow, Vol. 6, 79-84. (in Russian).

### Contact

Dr. Liudmyla Gorbachova  
Department of the Hydrological Researches  
Ukrainian Hydrometeorological Research Institute  
37, Prospekt Nauki,  
Kiev, Ukraine, 03028

lyudgor@list.ru