



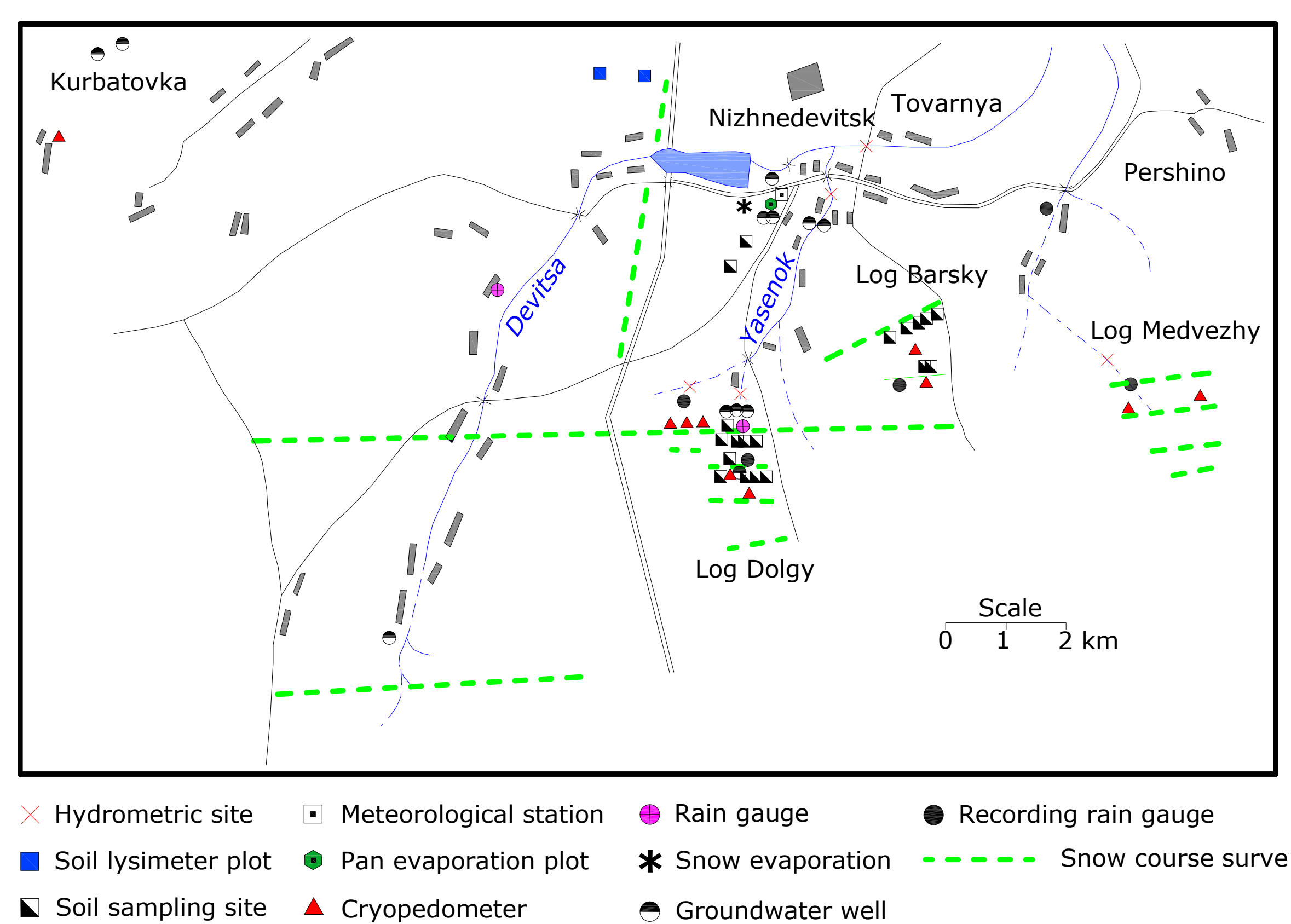
Nizhnedevitsk Water Balance Station (NDWBS), Devitsa basin, Russia



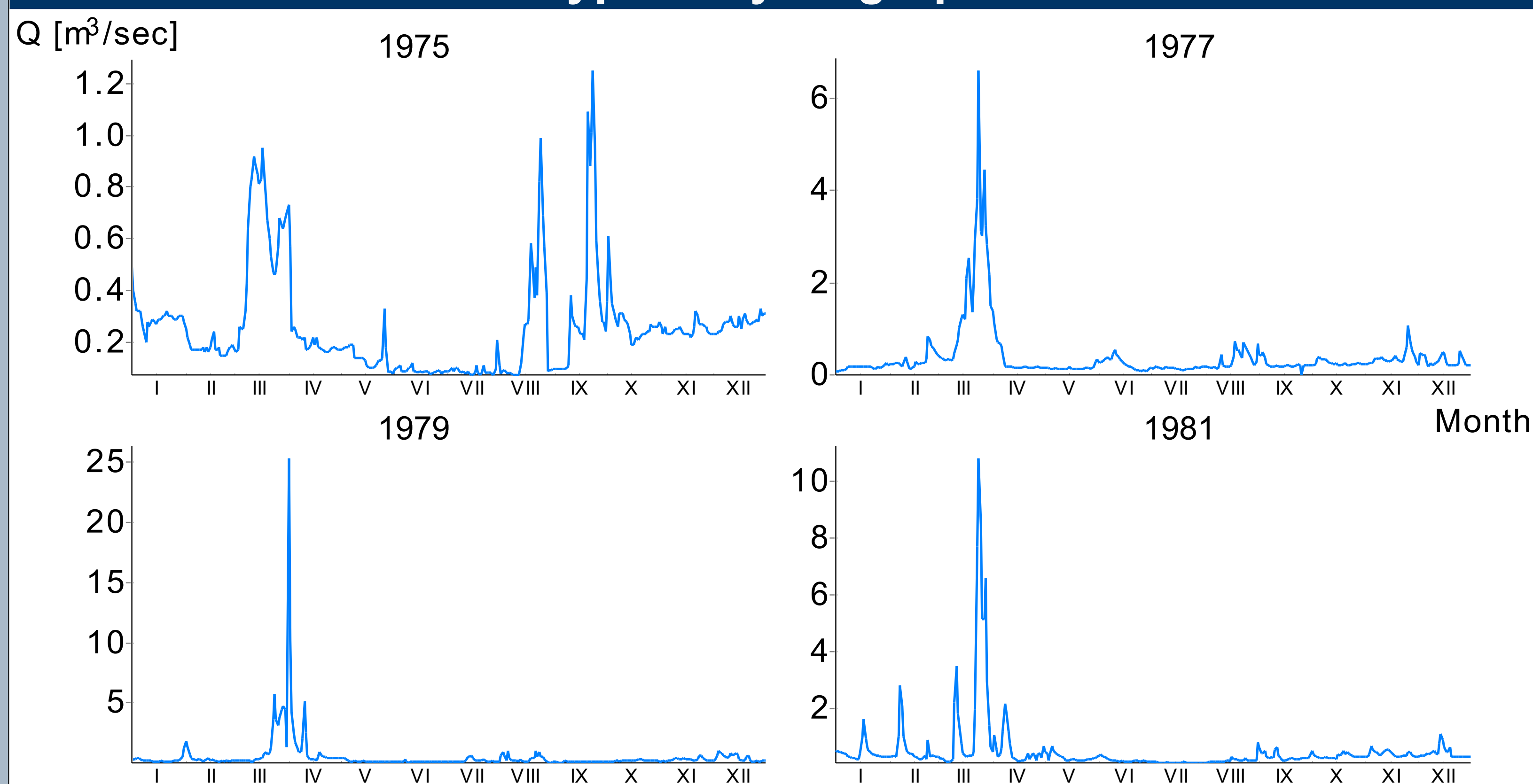
Basin characteristics

River Basin / River Basin	Don River
Operation (from... to...)	Since 1948, still in operation
Gauge coordinates:	51°54' N; 38°23'E/ 208 m a.m.s.l.
Catchment area:	103 km ²
Elevation range:	135 – 265 m
Basin type:	Forest-steppe, hills with gullies and gorges
Climatic parameters:	560 mm; 6.0°C (1948-1996)
Land use:	67% Arable lands, 19% meadow, 14% forest
Soils:	Common medium-thick chernozem
Geology:	Sandy-laminated clays and loams, quartz sand, chalk
Hydrogeology:	Shallow throughflow horizon (sand), two deep aquifers (quartz sand)
Characteristic water discharges:	Q _{min} = 0 m ³ /s, Q _{max} = 26.3 m ³ /s, Q _{average} = 0.40 m ³ /s (1974 – 1984)

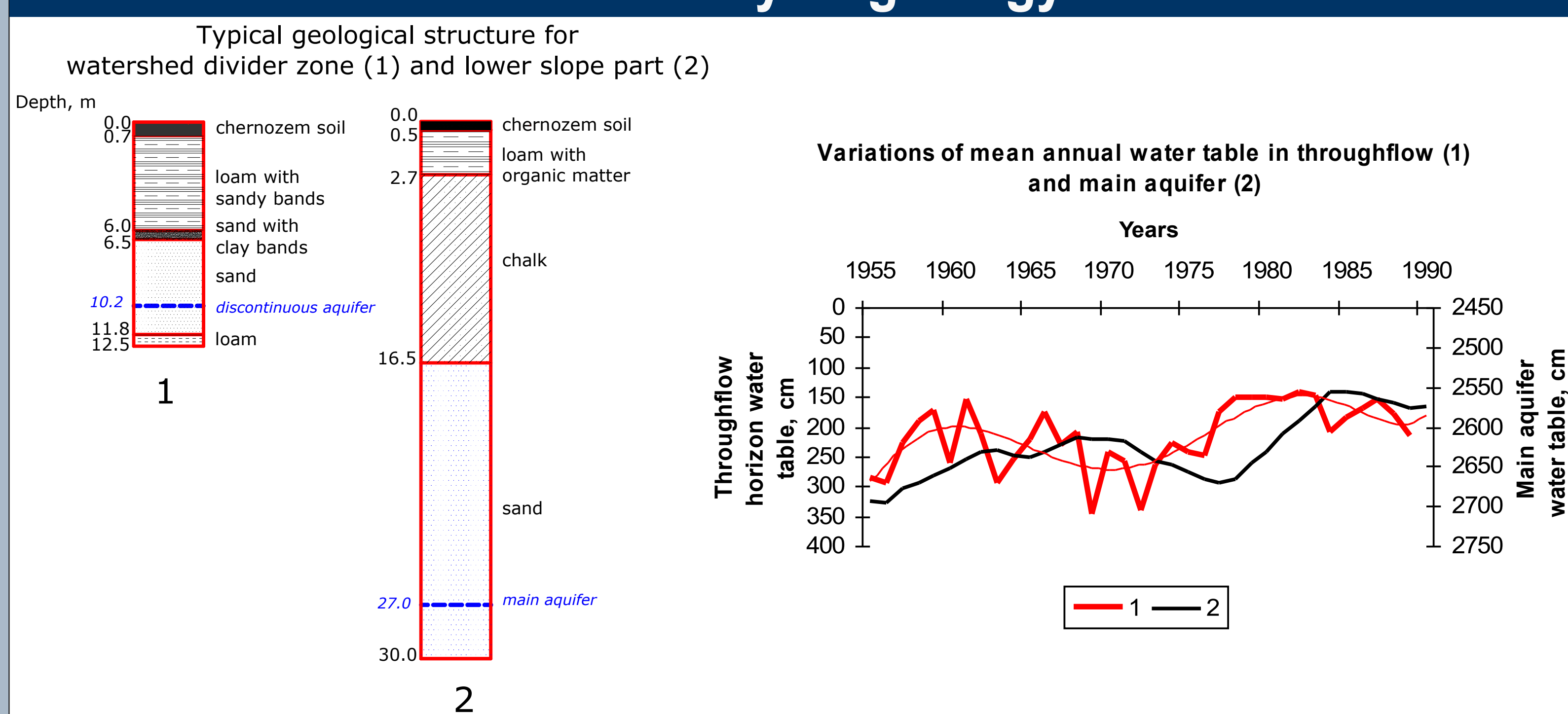
Map of the research basin



Typical hydrographs



Basin hydrogeology



Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
Stream flow	1948 – 1992	Minutes	2 (8)
Precipitation	1948–cont.	daily, minutes	3 (10)
Snow surveys	1948–cont.	Monthly, decadelly, event based	5
Evapotranspiration	1950–cont.	1 per 5 days	1
Snow evaporation	1950–cont.	Daily	1
Pan evaporation	1950–cont.	Daily (warm period)	1
Soil moisture content	1950–cont.	Monthly decadelly	11 (19) 2
Soil temperature at depths 0.1 – 3.2 m	1974–1981	Daily	1
Soil freezing/thawing	1958–cont.	1 per 5 days	8
Energy balance	1950–cont.	Decade	1
Ground water tables	1955–1992	1 per 10 days	14
Flow water chemistry	1950–cont.	Event based	2
Suspended sediments	1950–cont.	Daily, event based	6

Applied models

1. The model "Hydrograph" (in process)

Main scientific results

1. Volume of snow melting peak flood depends from formation of "lock layer" in unsaturated zone (combination of soil moisture content more 0.7 field capacity and soil freezing depth).
2. Direct flow (surface flow and throughflow) equals to about 8-10% of total. The rest part of runoff is forming by ground water from main aquifers.
3. Annual value of moisture seepage below throughflow horizon is change from 20 mm to 110 mm from year to year.
4. Time of moisture seepage from throughflow horizon to main aquifer is about 8-10 years.

Key references for the basin

1. Zhuravin, S.A. (2004) Features of forest-steppe small basins water balance: Nizhnedevitsk Water Balance Station case study. In: Northern Research Basins Water Balance. IAHS publ. № 290, 2004, p 78 – 90.
2. Zhuravin, S.A. (2002) Change of hydrological regimes over the central part of European Russia resulting from climate variations. In: FRIEND 2002, Regional Hydrology: Bridging the Gap between Research and Practice (ed. by H.A.J. van Lanen & S.Demuth) (Proc. Fourth FRIEND Conf., Cape Town, October 1993), 441-447. IAHS Publ. No.274.
3. Vershinina, L.K., Krestovsky, O.I., Kaliuzhny, I.L. & Pavlova, K.K. (1985) Assessment of snow melting water losses and forecasting of spring flood volume. Leningrad, Cidrometeoizdat, 189 p. (In Russian).

Contact

S.A. Zhuravin, O.M. Semenova
State Hydrological Institute, 23, 2-ya liniya, Vasilevsky Ostrov, 199053, Saint Petersburg, Russia

zhuravin@hotmail.ru, omakarieva@gmail.com