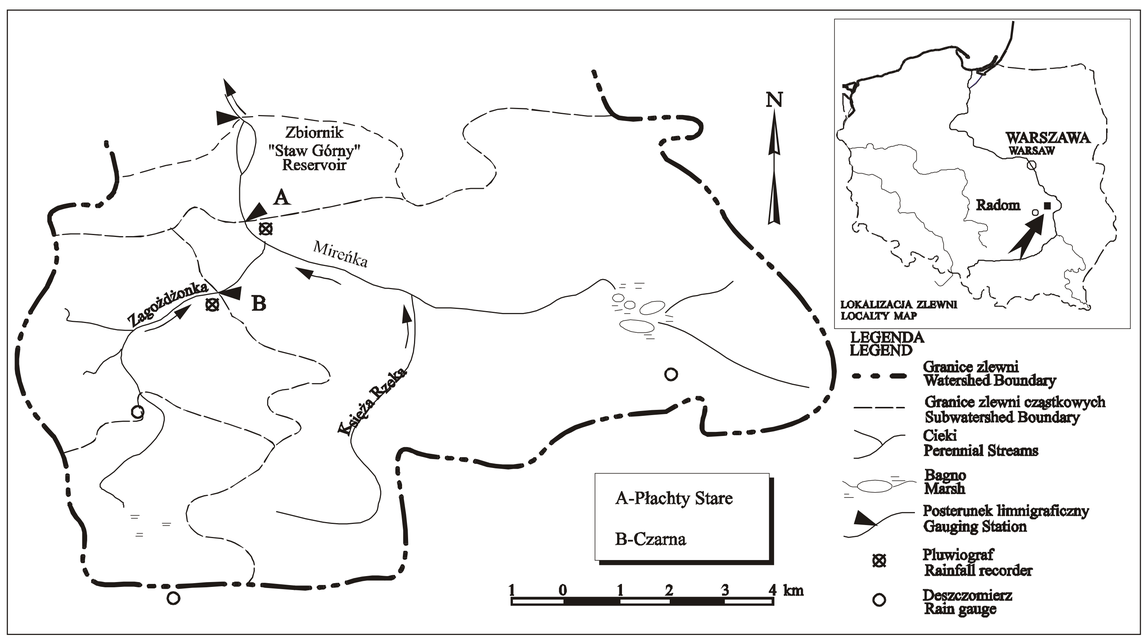
Płachty Stare and Czarna
Zagożdżonka, Poland

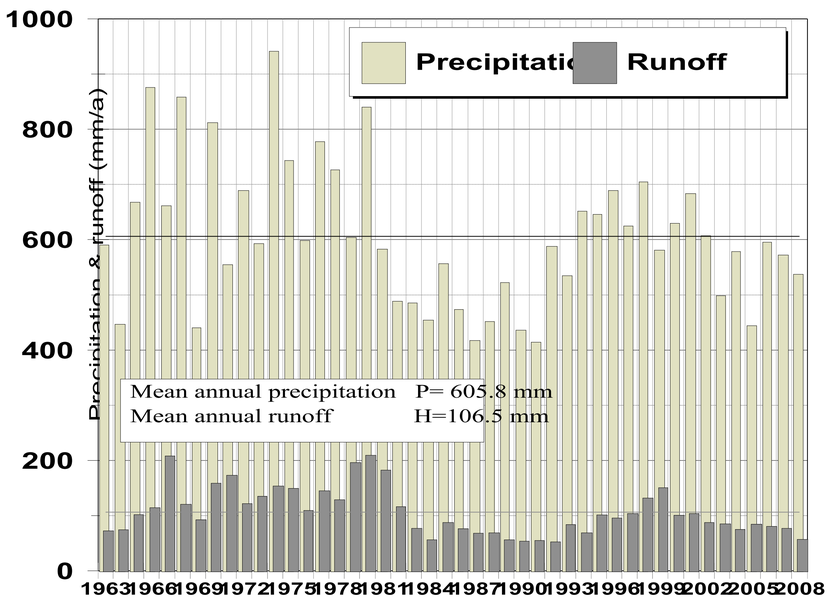
Basin characteristics

River Basin / River Basin (according EU-WFD)	Vistula River
Operation (from… to…)	Płachty Stare – since 1963, Czarna – since 1980
Gauge coordinates / Gauge datum:	Płachty Stare – 21°27' E and 51°27'N
Catchment area:	Płachty Stare- 82,4 km², Czarna 23,4km²
Elevation range:	148 – 185 m a.s.l.
Basin type: (alpine, mountainous, lowland)	Lowland
Climatic parameters: (mean precipitation, temperature and others)	Precipitation 605,8 mm, Runoff 106,5 mm
Land use:	Agricultural
Soils:	Sandy
Geology:	-
Hydrogeology: (Type of aquifers, hydraulic conductivity)	-
Characteristic water discharges: (Q_{min}, Q_{max}, Q_{mean})	Płachty Stare : Q mean- 0,278 m³/s, 100 Years flood- 25.1 m³/s

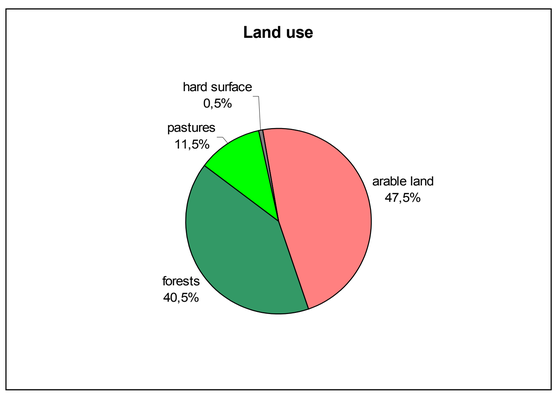
Map of the research basin

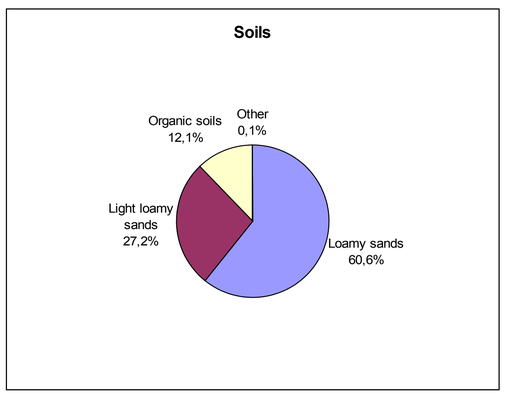


Mean hydrograph / Pardé flow regime



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





Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Station Name
Water stage/discharge	1963-cont.	Daily (since 2003 -10min)	Płachty Stare
Rainfall	1982-1996	Daily	Płachty Stare
Water stage/discharge	1995-cont.	10 minutes	Czarna
Rainfall	1996-cont.	Daily, Impuls /0.1mm	Czarna
Water and air temp., humidity	1996-cont.	10 minutes	Czarna
Soil temp.	2003-cont.	10 minutes	Czarna
Ground water level	2008-cont.	10 minutes	Czarna
Abedo,wind velocity	2007-cont.	10 minutes	Czarna/Płachty

Applied models

1. SEGMO (SEdimentGraph MOdel – Warsaw University of Life Sciences)
2. AGNPS (Agricultural Non Point Source Pollution Model – USDA – ARS)
3. CCHE1D (Center for Computational Hydrosciences and Engineering- The University of Mississippi)

Main scientific results

- rainfall-runoff model development for agricultural catchments (SEGMO)
- estimation of lag times of rainfall events
- probable annual maxima of flow for small catchment
- bed load (sediment trap) and suspended sediment transport in agricultural catchment
- river and reservoir sedimentation modelling (CCHE1D model)
- impact of various land management on water quality (AGNPS model)
- grain size distribution of suspended sediment during floods (laser diffraction method)
- relation between phosphorus concentration and suspended sediment transport
- erosion processes (DR-USLE model – Warsaw University of Life Sciences)
- suspended sediment transport during snowmelt periods
- environmental monitoring station development: http://www.traxelektronik.pl/pogoda/hydro/stacja.php?idst=90&c9=1237902000

Key references for the basin

- Sediment transport intensity and reservoir siltation on the Zagożdżonka river / Zbigniew Popek, Kazimierz Banasik, Leszek Hejduk.TEKA Commission of Protection and Formation of Natural Environment 2007, Vol. 4, s. 207-212
- Estimation of T-year flood discharge for a small lowland river using statistical method / Kazimierz Banasik, Andrzej Byczkowski.Annals of Warsaw Agricultural University. Land Reclamation 2006, nr 37, s. 27-31
- Prediction of siltation process of a small reservoir in Poland using CCHE1D model / Leszek Hejduk, Kazimierz Banasik, Zbigniew Popek. Advances in hydroscience and engineering, Vol. 7 : the 7th International Conference on Hydroscience and Engineering / ed. M. Piasecki [i in.]. - Philadelphia, 2006. - S. 471-472

Contact

Department of Hydraulic Engineering and Environmental Recultivation,
Warsaw University of Life Sciences
02-776 Warsaw, Nowoursynowska 159
Dr Leszek Hejduk, Prof. dr Kazimierz Banasik
leszek_hejduk@sggw.pl, kazimierz_banasik@sggw.pl

Additional references (since 2006) available at: http://www.bg.sggw.waw.pl/ang/index.html