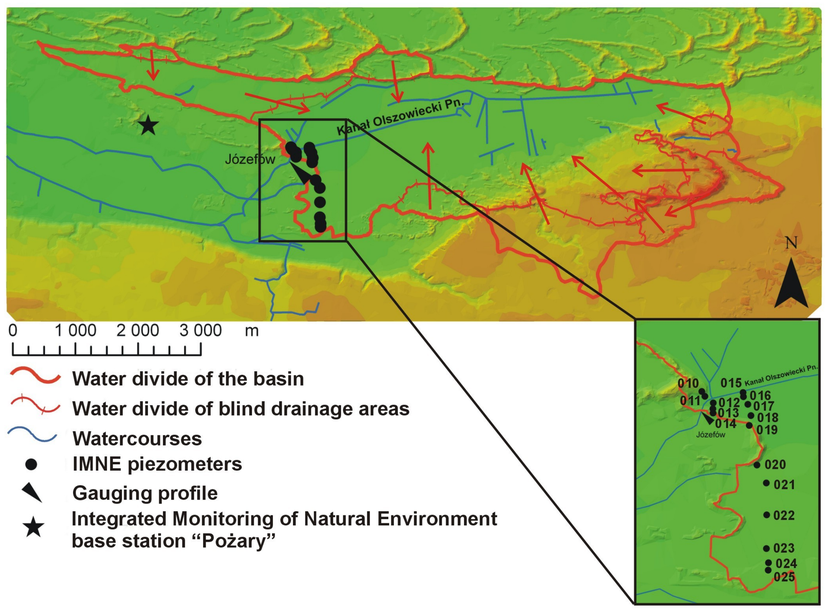
Pożary

Pożary basin, Poland

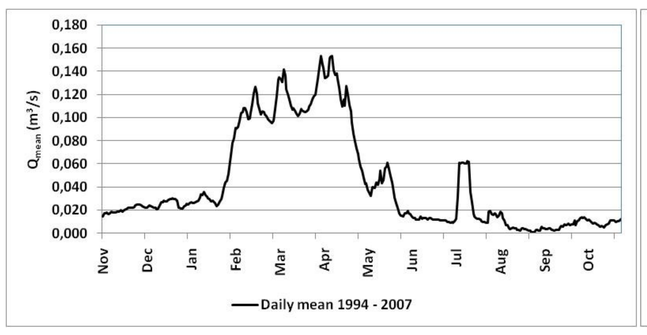
Basin characteristics

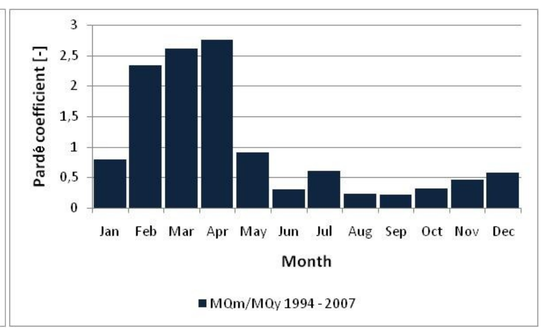
River Basin / River Basin (according EU-WFD)	Bzura river basin / Vistula river basin
Operation (from… to…)	Since 1.11.1993, still in operation
Gauge coordinates / Gauge datum:	20°29'E; 52°17'N; 70.00 m a.s.l.
Catchment area:	20.17 km^2
Elevation range:	71.7 – 103.75 m a.s.l.
Basin type: (alpine, mountainous, lowland)	Lowland
Climatic parameters: (mean precipitation, temperature and others)	500 mm (1991 – 2008), 8.2°C (1994 – 2007)
Land use:	40% pine forest, 20% alder wood, 20% lowmoor, 10% deciduous forest, 10% grasslands
Soils:	Peat soils, black earths, podsol soils, rusty soils
Geology:	Quaternary sediments: sands and peats
Hydrogeology: (Type of aquifers, hydraulic conductivity)	Main aquifer in sands; in places under the peats water table is confined and perched aquifer occurs.
Characteristic water discharges: (Q_{min}, Q_{mean}, Q_{max})	0.0 l/s, 44.0 l/s, 683.0 l/s (1994 – 2007)

Map of the research basin



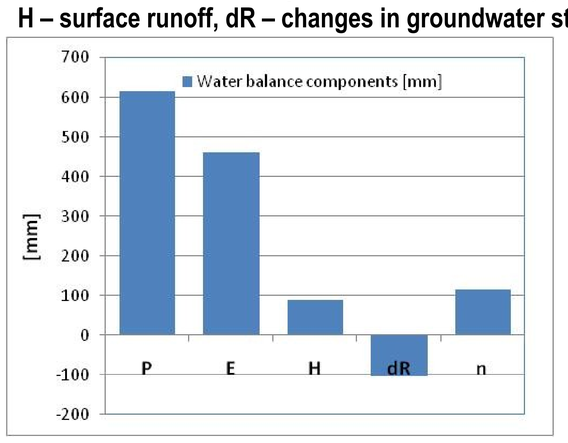
Mean hydrograph / Pardé flow regime

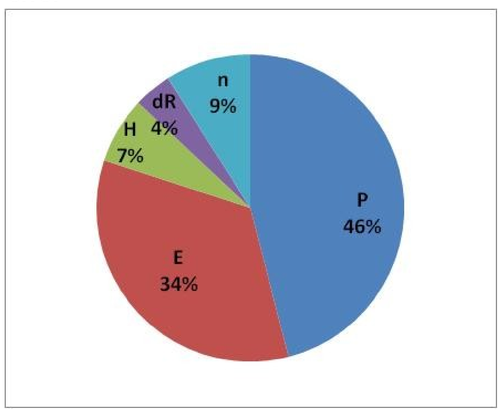




Special basin characteristics (hydrogeology, lakes, reservoirs etc.)

Mean water balance components in mm and % (1999 – 2000): P – precipitation, E – evapotranspiration, H – surface runoff, dR – changes in groundwater storage, n - error





Instrumentation and data

Measured hydrological parameters	Measuring period	Temporal resolution	Number of stations
River water stages	1.11.1993 – cont.	1 day	1
Groundwater level	1.11.1993 – cont.	1 day	16
Precipitation	1.11.1993 – cont. 1.11.2000 – cont.	1 day 1 h	1
Air temperature, humidity, soil temperature	1.11.1993 – cont. 1.11.2000 – cont.	7, 13, 19 hrs 1 h	1
Chemical composition of precipitation waters	1.11.1993 – cont.	1 month	1
Chemical composition of surface waters	1.11.1993 – cont.	1 month	1
Chemical composition of groundwaters	1.11.1993 – cont.	1 year	16

Applied models

DYSCHEM – mathematical model of water and solute transport in unsaturated zone

Main scientific results

1. The biggest part of precipitation in the interception process is stopped by forest plant communities in juvenile form which is caused by their high stand density;
2. The favourable infiltration conditions in the dune area and less favourable on the wetlands cause the dune zones to be the main place of groundwater recharge in the basin area. At the same time the groundwater beneath the dunes are have low levels of mineralization. This is caused by the very long way the water and solutes must travel from the soil surface to the groundwater table;
3. The greatest role in summer recharge of groundwaters is played by long lasting intensive precipitation causing an immediate reaction of the swamp area groundwater; only during such a precipitation episodes the recharge losses caused by evapotranspiration are the smallest;
4. The main source of chloride ions in the basin are precipitation waters, this is illustrated by their concentration decrease in the groundwater while a quite small load in precipitation waters is observed;
5. The vertical component prevails in the basin water and chemical substance circulation due to the good permeability of surface formations and small possibilities of overland flow forming;
6. Water storage in wetlands increasing thanks to overgrowing and not maintained watercourses enables relative quick evolution of meadows into lowland moor. General tendency to lowering of groundwater levels in years 1994 - 2004 has not restrained this process. The most probably, limitation of river runoff in the result of relinquishment of channel maintenance causes increase in water storage capacity of the basin and is conductive to expansion of hygrophilous plants species.

Key references for the basin

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2. Lenartowicz M., Andrzejewska A., Ferchmin M., Owadowska E., Wierzbicki A., 2006, *Stacja Bazowa Pożary (Base stadion „Pożary"),* [in:] *Aktualny stan, przemiany i funkcjonowanie geoekosystemów Polski w latach 1994-2004 na podstawie Zintegrowanego Monitoringu Środowiska Przyrodniczego (Actual state, evolution and functioning of geoecosystems in Poland in years 1994-2004 on the base of Integrated Monitoring of Natural Environment),* Kruszyk R. (ed), Biblioteka Monitoringu Środowiska, IOŚ, Warszawa, 173-212.
3. Lenartowicz M., 2005, *Modelowanie procesów hydrologicznych i geochemicznych w bagiennej zlewni nizinnej (na przykładzie zlewni Pożary) (Modeling of hydrological and geochemical processes in lowland swampy basin – case study of „Pożary" basin),* Monografie Komitetu Gospodarki Wodnej PAN, z. 25.

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