

Žeimena river, Lithuania

Location

The River Žeimena is located in the east of Lithuania. It is a tributary of the river Neris. The length of the Žeimena is 79.6 km and its catchment area is 2793 km². The headwater of the River Žeimena is Lake Žeimena (altitude 138 m). The River flows southwest through the small towns Švenčionėliai and Pabrada and flows into the River Neris.

The rivers Šventelė-Dėmė, Saria and Mera-Kunė are the western tributaries with a catchment areas of more than 50 km². The rivers Kiauna, Lakaja, Dubinga and Jusinė are the eastern tributaries with a catchment areas of more than 50 km².

Catchment description

The River Žeimena flows in the middle of South East Plain of Lithuania. The river flows through sandy pine woods, and often meanders through wetlands. Forests occupy 31% of the Žeimena River catchment. Sandy soils prevail in the basin (76% of the total catchment's area). The other dominant soil type is loam.

The catchment is located in hilly moraine uplands and sandy plains of glacial origin.

A specific characteristic of the Žeimena River catchment is an abundance of the lakes. There are 530 (> 0.5 ha each) lakes, and they occupy about 180 km² of area (6,4% of total area). The longest lake of Lithuania Asveja (22 km length) and the deepest lake Tauragnas (60,5 m depth) are in the catchment of River Žeimena. Whereas the density of the river network in the catchment is low and reaches only 0.47 km/km².

Žeimena is one of the cleanest rivers in Lithuania. There are no big cities, industrial plants in its basin area. The percent of agricultural land is the least in country (17% of total area) as well as density of livestock. There are no the straightened rivers or dams on it and it is part of the main spawning places of salmon in Lithuania.

Almost the whole nature of the catchment is protected by law: a large area belongs to Aukštaitija National Park, to Asveja and Labanoras Regional Parks, to NATURA 2000 territory, and to landscape, ichtiological, botanical and ornithological reserves.



Hydrological Observatory description

Key descriptors:

Catchment area at monitoring site	2600 km ²
Flow and rainfall data available from	1954
Lakes in the catchment area at monitoring site	7%
Wetlands in the catchment area at monitoring site	10%
Forests in the catchment area at monitoring site	37%
Sand in the catchment area at monitoring site	76%
Average annual runoff	255 mm
Average annual flow	21.0 m ³ /s
Highest peak flow and date	112 m ³ /s 21 Apr.1958 04 21
Lowest daily mean and date	5.93 m ³ /s 11 Jan. 1960

Hydrological summary

The distinctive feature of the rivers' hydrological regime is that the distribution of runoff during the year is natural (no regulation). There are many lakes in the basin (6.4%). The sand deposits of fluvio-glacial origin prevail here (25%-76%), consequently the rivers have abundant groundwater feeding.

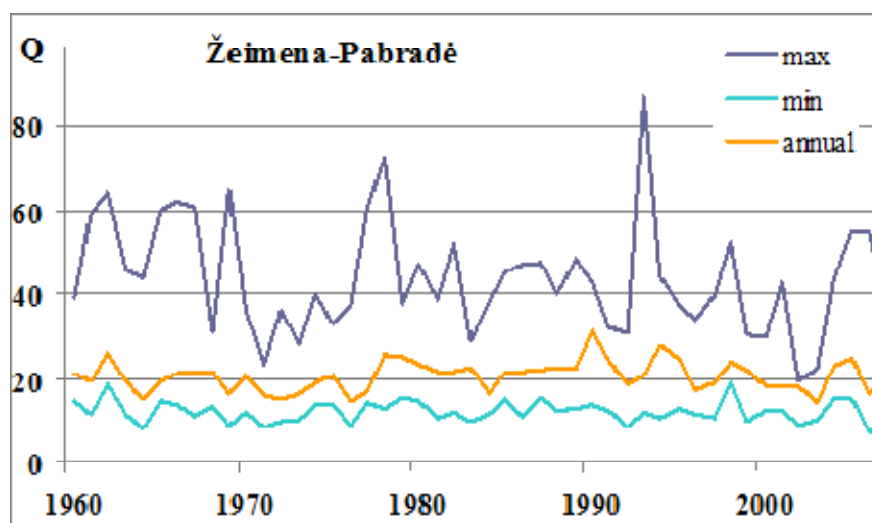


Figure. Long-term streamflow (m³/s) in downstream gauging station Pabradė

Data availability

The flow data were measured in 9 water gauging stations on the River Žeimena and other rivers of its catchment. Almost all WGS in the basin were closed, except Pabradė WGS on the River Žeimena.

Hydrological Observatory description

River	WGS	Altitude of WGS	Catchment area at WGS, km ²	Period of observations	Q, m ³ /s	Q _{max} , m ³ /s of spring flood	Q _{min} , m ³ /s of dry period	Precipitation, mm	Evaporation, mm
Švogina	Vaišniūnai	138.36	82.6	1960-1966	0.54	5.00	0.24	663	410
Žeimena	Kaltanėnai	137.00	776	1961-2000	5.59	11.3	2.78	663	417
Žeimena	Pabradė	115.68	2600	1954-2009	20.9	43.7	12.0	661	386
Dringykščiai	Meironys	137.43	150	1960-1962	1.35	2.69	0.78	663	388
Srovė	Ginučiai	138.52	179	1961-1963	1.62	3.47	0.91	663	382
Būka	Vaišnoriskė	145.48	140	1979-1999	1.23	3.16	0.71	663	411
Kretuona	Pakretuonė	144.00	155	1963-1967	1.04	3.41	0.46	662	410
Lakaja	Lakajai	144.34	254	1936-1943, 1947-1969	2.14	5.35	1.05	662	368
Peršokšna	Januliškis	141.60	87.2	1983-1999	0.69	1.52	0.40	662	406

Daily and monthly discharges and water level data as well as other hydrological information are available from archives of the Lithuanian Hydrometeorological Service. Water quality parameters of the River Žeimena are measured at 2 monitoring stations (at Kaltanėnai and below Pabradė) at present. The measurements are carried out by the Environmental Protection Agency.

Hydrological Observatory description

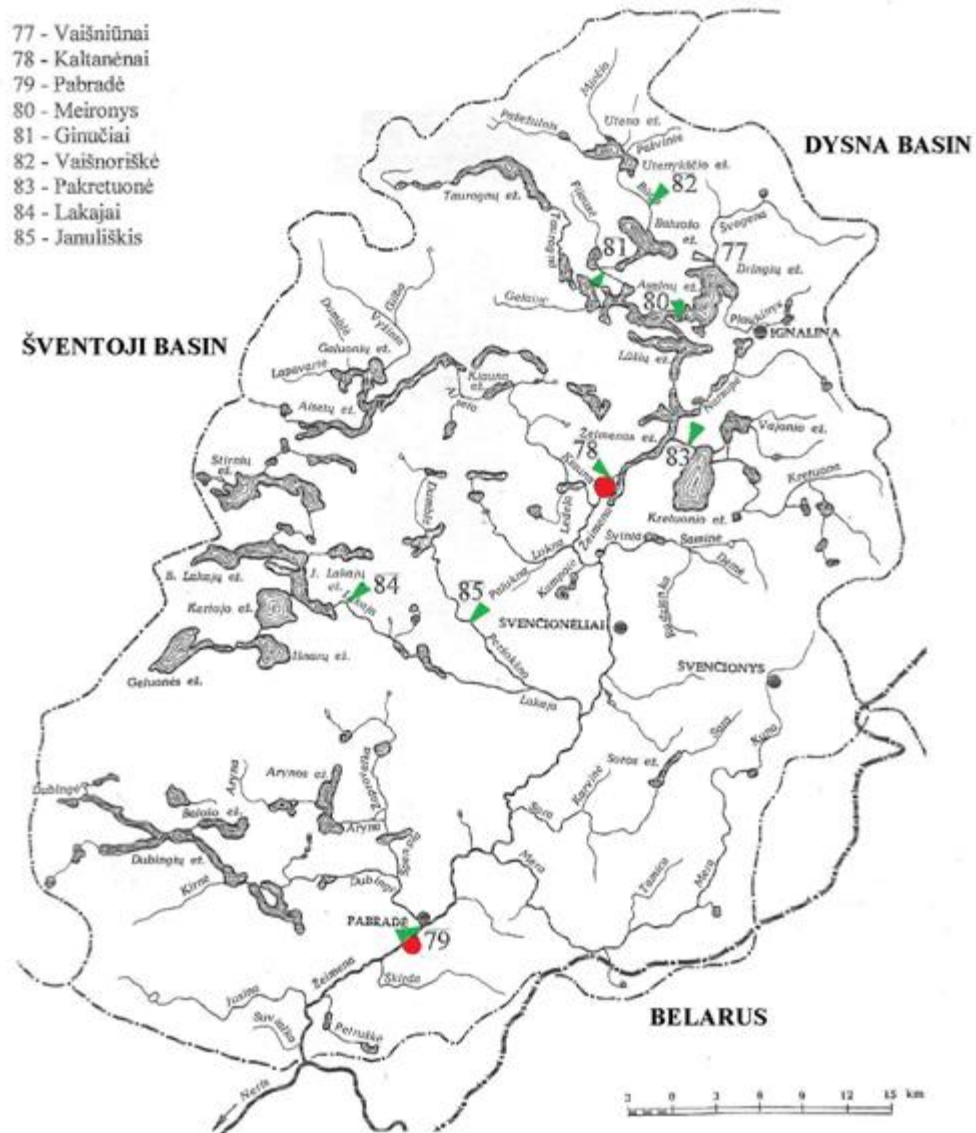


Figure. Water gauging stations (green triangle) and water quality stations (red circle) in the cathment of the river Žeimena

Hydrological Observatory description

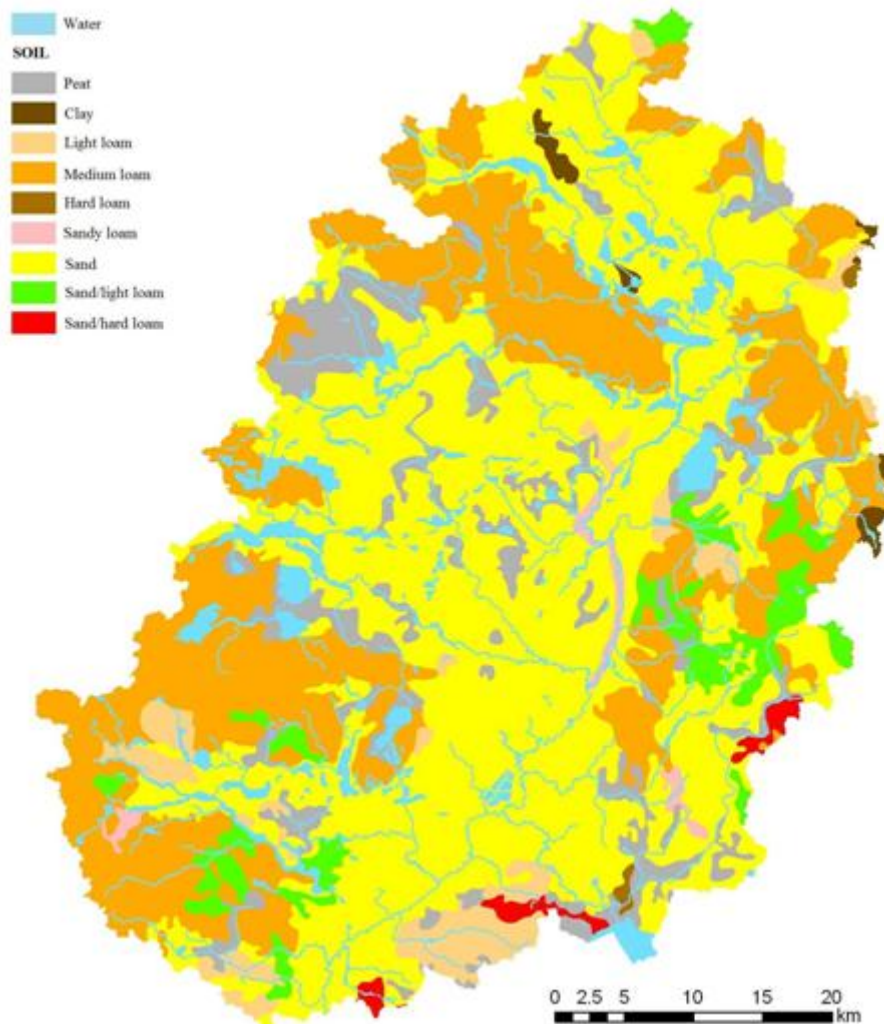


Figure. Soils in the catchment of the River Žeimena

Research Activity and Outputs

The Zeimena catchment is a part of Nemunas river basin. At present, the Nemunas river basin management plan is being prepared. These are most important objectives for the Zeimena catchment: natural nature preservation and tourism development.

The hydrography and runoff of the Zeimena catchment have been investigated by scientists of Lithuanian Energy Institute. The Salmon Action Plan is implemented for Lithuania. Natural and viable salmon populations have survived almost only in the Neris and Zeimena rivers. The Lithuanian scientists have done investigations on density of salmon and monitoring of spawning places. Research on Rytu Aukštaitija lakes and rivers (Zeimena catchment) in the field of tourism and recreation is being done for the period of 2007 – 2013.

Research outputs for the network could be estimated climate change impacts on the river runoff, and modeling (HBV).

Institutional support

All monitoring stations are operated under state supervision according to national monitoring programmes.

Value to network

The River Žeimena is located in a region of a low agricultural and urban activity. The human impact on the water quality and resources are not considerable. An abundance of lakes and old pinewoods as well as clean and clear water of the rivers creates very good conditions to recreation. River Žeimena is one of the main places of salmon's and other valuable fish spawning. The main objective of research of this catchment would be protection of the water quality against possible negative effects of climate change and anthropogenic activity.

The Žeimena Observatory provides data for hydrological conditions that are common in its region but which are quite different from those monitored by many other observatories in the network. Some important distinguishing features of the Žeimena catchment in the European context are: large cover of lakes, absence of dams, absence of artificially straightened of the river sections (i.e. natural meandering), almost no influences of industry, agriculture or households, high baseflow, and no flow regulation.

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References

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