



Interreg
Latvija–Lietuva

European Regional Development Fund



EUROPEAN UNION

**Ecological flow estimation in Latvian – Lithuanian Transboundary river
basins (ECOFLOW) LLI-249**

**HYDROGRAPHS
FOR SELECTED CASE-STUDY RIVERS
IN LITHUANIAN PART OF LIELUPĒ RIVER
BASIN DISTRICT**



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Abbreviation

HPP	Hydropower Plant;
RBD	River Basin District;
Q	Multi-year average discharge, m ³ /s;
WGS	Water Gauging Station

I. SELECTION OF CASE STUDY SITES IN LITHUANIAN PART OF LIELUPĖ RBD

Only 5 small hydropower plants (HPP) were constructed on the rivers of Lielupė RBD. Data of water discharge are available only for 2 of those rivers; however, the remaining 3 rivers are not investigated. Currently, water discharge measurements are carried out at 4 water gauging stations (WGS) in the rivers where HPPs are operating (Table 1). The Ustukiai WGS in the Mūša River and Bernatoniai WGS are located downstream the hydropower plants, and have a long data sets of water discharge.

For assessment of HPP impacts on flow regime alteration and on fish communities in Lielupė RBD, three river sites were selected as the case studies, based on the level of their investigation (Fig. 1, Table 1 and Table 2). The first (I) case study is related to the Dvariukai HPP (Table 2) on the Mūša River (Ustukiai WGS, Table 1), the second (II) case study – to the Akmeniai HPP (Table 2) on the Lėvuo River (Bernatoniai WGS, Table 1) and the third (III) case study – to the Stirniškiai HPP (Table 2) on the Suosa River which is not investigated.

Table 1. Currently existing water gauging stations (WGS) on the rivers selected for case studies

No	River	WGS	Distance from the mouth, km	Catchment area, km ²	Period of observations	Multi-year average discharge (Q), m ³ /s
1	Mūša	Ustukiai	56.1	2284	1957-2016	10.4
2	Mūša	Žilpamūšis	42.0	5010	2001-2016	22.2
3	Lėvuo	Kupiškis	109.3	303.3	1955-1999, 2007-2016	1.79
4	Lėvuo	Bernatoniai	47.2	1144	1967-2016	3.55

Table 2. Small HPPs on the rivers selected for case studies

No	SHPP	River	Distance from the mouth, km	Catchment area, km ²	SHPP construction year	Installed capacity, kW
1	Dvariukai	Mūša	81.5	1927	2001	494
2	Akmeniai	Lėvuo	85.9	873.3	1999	35
3	Stirniškiai	Suosa	1.8	95.1	2006	60

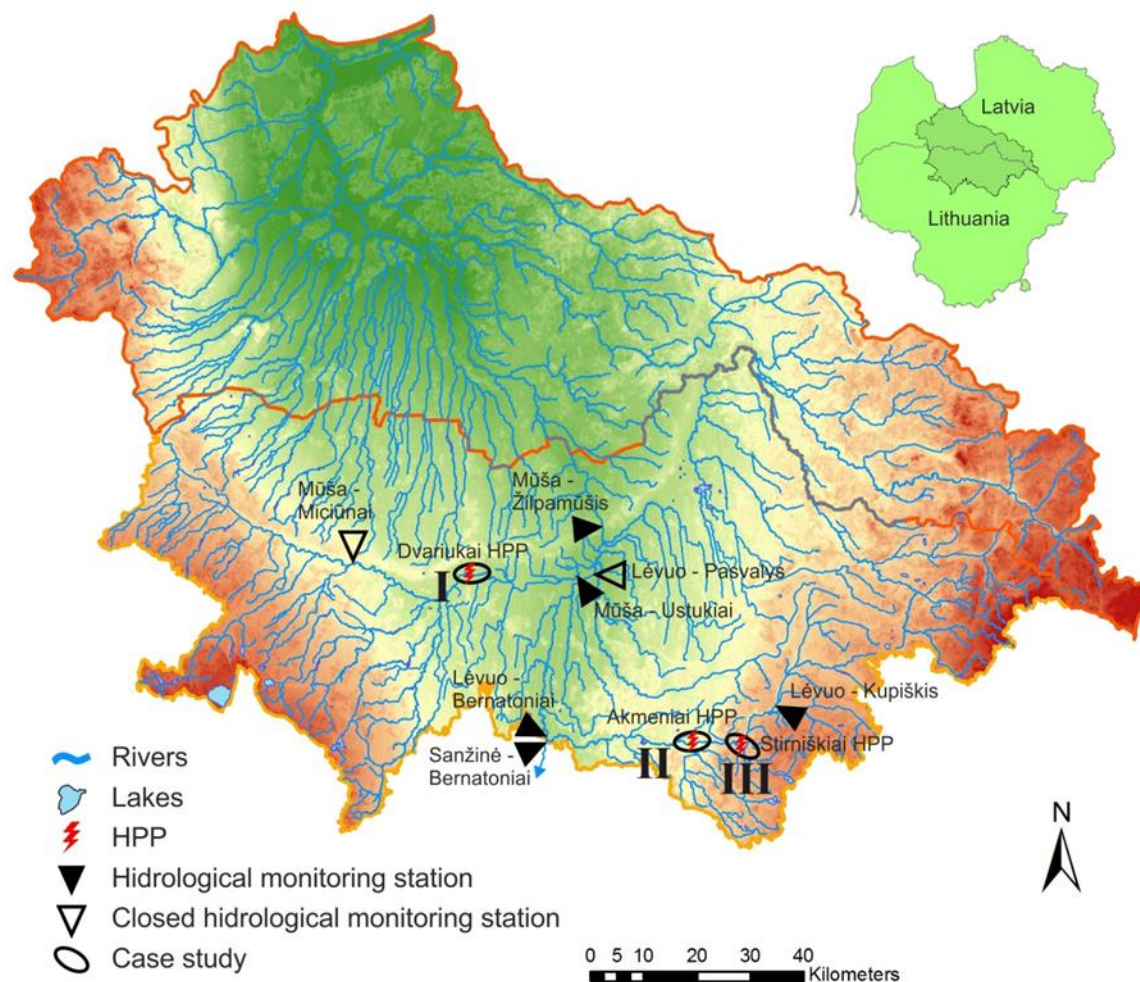


Figure 1. Case study sites in Lielupė RBD

II. HYDROGRAPHS FOR SELECTED CASE-STUDY RIVERS

In order to assess the natural river runoff, i.e. without antropogenic (HPP) impact, the data sets of water discharge of 3 WGS for the period of 1961-2016 were used. Module coefficients (k) of water discharge were calculated for individual years. When the estimated values of modular coefficients ranged from 1.3 to 1.5, the year was accepted as a wet, when from 0.9 to 1.1 – normal year, and when from 0.5 to 0.7 – dry year. For each case study, 7 years were selected for every group of years: wet, normal, and dry (Table 3).

Table 3. Module coefficients of water discharge of the natural river regime for wet, normal and dry years

No	River - WGS		Wet years (k=1.3-1.5)		Normal years (k=0.9-1.1)		Dry years (k=0.5-0.7)	
			Year	k	Year	k	Year	k
1	Mūša – Ustukiai	1	1974	1.48	1966	0.91	1961	0.62
		2	1978	1.38	1982	0.91	1969	0.53
		3	1979	1.41	1988	0.98	1971	0.48
		4	1983	1.32	1989	1.01	1972	0.61
		5	1987	1.46	1991	0.95	1977	0.63
		6	1990	1.37	1997	0.99	1984	0.56
		7	1994	1.45	2000	0.87	1996	0.66
2	Lėvuo – Bernatoniai	1	1978	1.35	1970	1.02	1971	0.67
		2	1980	1.46	1979	1.10	1972	0.59
		3	1981	1.25	1982	1.01	1973	0.56
		4	1989	1.27	1985	1.00	1976	0.51
		5	1990	1.26	1988	0.95	1977	0.64
		6	1994	1.29	1991	1.02	1984	0.69
		7	1998	1.53	1997	0.99	1996	0.58
3	Suosa – Stirniškiai	1	1962	1.29	1963	0.91	1961	0.74
		2	1980	1.24	1966	0.93	1964	0.67
		3	1983	1.34	1968	1.04	1969	0.77
		4	1985	1.26	1970	1.05	1972	0.66
		5	1986	1.44	1979	0.99	1973	0.78
		6	1987	1.48	1984	1.02	1976	0.67

According to 7-year averaged daily water discharge data (Annex I, Tables 1-9) typical hydrographs for 3 WGSs were created for the wet, normal and dry years.

Mūša River

The Lielupė RBD comprises the Mūša River, Nemunėlis River and Lielupė Small Tributaries sub-basins which are located in the northern part of Lithuania. The main parts of basins of the rivers Mūša and Nemunėlis are situated in Lithuania. These rivers merge in the territory of Latvia, at the Bauskē city. After the confluence, the river is known as the Lielupė (Aa) River.

The first case study is in the Mūša River which is the eleventh longest river in Lithuania (Fig. 1). The length of the Mūša River at the confluence with the Nemunėlis River is 157.3 km. In the territory of Lithuania length of the Mūša River

is 133.1 km, the catchment area is 5296.7 km². The Lithuanian part of the Mūša River catchment comprises 97% of its total area.

The Mūša River begins on the western edge of Tyrelis Swamp, 85.0 m above sea level. From the source, the Mūša River flows to the east and after confluence with its largest tributary in the territory of Lithuania - the Lėvuo River, the Mūša River flows to the north and north-west and enters the territory of Latvia. In Lithuania, the Mūša River flows through flat plains: Venta River *Middle Reaches* Lowland, Mūša-Nemunėlis Lowland, and Žiemgala Lowland. The average bed slope of the Mūša River in Lithuanian territory is 0.49 m/km. The upper reaches of the Mūša River drain the Venta River *Middle Reaches* Lowland, so the bed slope of these reaches is not high (about 0.38 m/km). Further, the Mūša River flows through the Mūša-Nemunėlis Lowland *and here its bed slope is higher (0.57 m/km). The Mūša River leaves* the territory of Lithuania and enters Latvia in the Žiemgala Lowland. *The lower reaches of the river and its mouth are located in the territory of Latvia.* The Mūša River bed slope in the reach from the source to the Dvariukai HPP (case study I) is 0.50 m/km.

Four river types differing in the characteristics of their aquatic communities have been identified within the Mūša River. The reach of the Mūša River from the source to the beginning of Dvariukai HPP reservoir is classified as the water body of types 2 and 5; the reach of Dvariukai HPP reservoir is classified as the water body of type 1; the reach from Dvariukai HPP to the Lithuania-Latvia border is assigned to the types 5 and 4. (Lielupē River Basin District Management Plan, 2010).

The Mūša River basin is dominated by thin layer of soil. Dolomite and gypsum rocks lie close to the surface in the some areas of basin, so the karst relief dominates here. Fertile agricultural land predominates in this basin. 14.1% of the Mūša River basin area is covered by forests, 0.5% by lakes, and 5.1% by swamps and marshes, therefore 87.4% of its surface is wetlands.

1 small hydropower plant is constructed on the Mūša River in the Lithuanian territory. The river reach below Dvariukai HPP is selected as a case study I.

Case study I (Fig. 1). The hydropower plant Dvariukai is located at the end of the upper reaches of the river. It was constructed in 2001, on previously created reservoir which was used for irrigation and fishery. Ustukiai WGS is 25.4 km downstream hydropower plant. There are no large tributaries between HPP and WGS, and catchment area of Ustukiai WGS is 18% larger than area of Dvariukai HPP.

The surrounding area of the Mūša River below Dvariukai HPP is a slightly hilly morainic plain. Eastward oriented upper reaches of the Mūša River (up to Pasvalys) nears to the southern foot of Linkuva moraine ridge, so almost no left tributaries.

The Mūša River valley at Ustukiai WGS is *trapezoid*-shaped. The slopes of a valley are steep: right slope is up to 15 m, left one is lower – up to 6 m. Both slopes are composed of loams. The left-bank floodplain is well expressed, up to 60 m wide. The meadows prevail in the floodplain.

Sand and sandy loams with mud substrates are found to cover the bottom of the river bed. There are large boulders in the reach of WGS. Riverbed overgrows with very dense aquatic vegetation which remains during the year. The right bank is steep, up to 7 meters high, the left one is flat.

Hydrological regime of the Mūša River at Ustukiai WGS is characterized by very high spring flood, summer low flow and rain floods during autumn and winter seasons. Water discharge data of the Ustukiai WGS were analysed for preparation of runoff hydrographs of the Mūša River (Fig.2). Typical runoff hydrographs were created for wet, normal and dry years, on the basis of daily discharges (Annex I, Table 1-3).

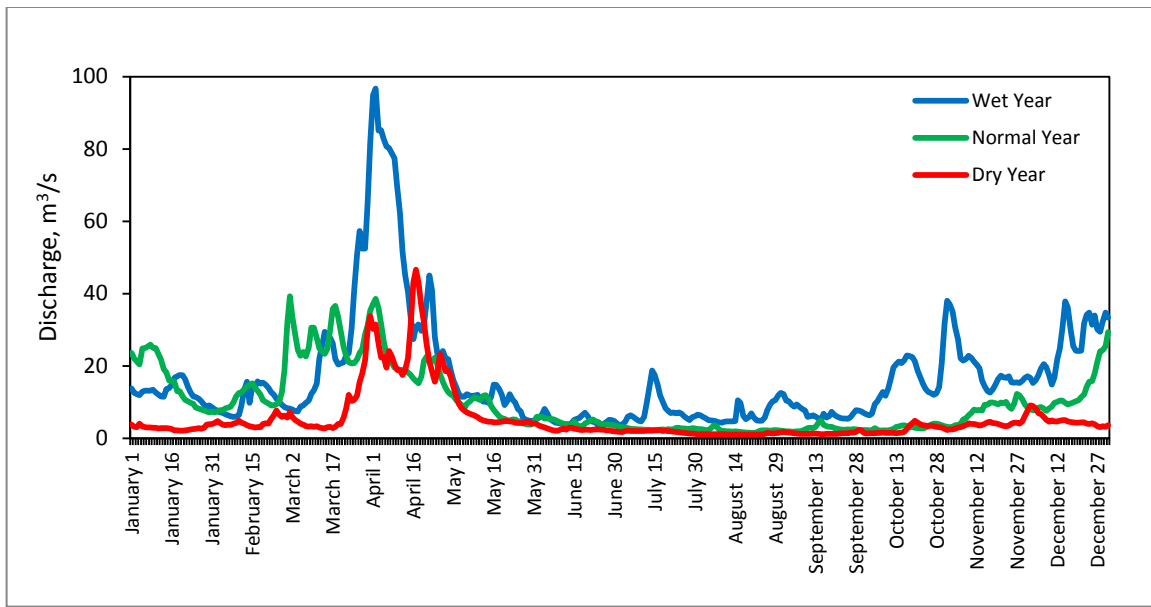


Figure 2. Hydrographs of Wet, Normal and Dry Years, Mūša River - Ustukiai WGS

Hydrographs in Fig. 2 indicate that in the Mūša River at Ustukiai WGS, the biggest differences of runoff among wet, normal and dry years are in spring and autumn, while the differences are not significant during the summer low flow period. During wet years, spring flood is very high and well-expressed, while during normal and dry years spring flood is lower and longer, especially in the normal years. Low flow period lasts very long time, from middle May to the beginning of November in the normal and dry years, while during wet years, it is shorter with some rain floods. Water discharge in the autumn and winter periods is very high in wet years, high in normal years and very low in dry years.

Lėvuo River

The Lėvuo River is the largest tributary of the Mūša River in Lithuanian territory. It is a right-bank tributary, entering the Mūša River 50.5 km from the mouth. The river flows only in territory of Lithuania.

The length of the Lėvuo River is 145.0 km; the catchment area is 1628.8 km². The Lėvuo River gets its start at Lėvenaitis Lake which is in Notigala Swamp; 97.5 m above sea level. The Lėvuo River flows through flat plain – Mūša-Nemunėlis Lowland. At the upper reaches, the Lėvuo River runs in a southwesterly direction. Here it flows through the surface, which is considered to

be a transition zone between the Western Aukštaičiai Plateau and Mūša-Nemunėlis Lowland. At a Kupiškis reservoir (Kupiškio marios), the river enters into the ancient valley, which deepens and extends southward. A width of valley at Kupiškis town is 0.6 km. Here the land surface is characterised by individual residual morainic ridges or their ranges. Further, the Lėvuo River nears these morainic ridges and at the mouth of the Suosa River it crosses them and its valley becomes deep on both sides. The river leaves the ancient valley at Akmeniai HPP and enters to the wide valley. At the middle reaches, the Lėvuo River flows generally westward and at a Karsakiškiai village it crosses sandy ancient delta where the morainic ridges occasionally protrude above the surrounding land surface. At the lower reaches (from the Sanžilė canal), the river turns north and enters the lowest part of the Mūša-Nemunėlis Lowland where it reaches the Mūša River.

The average bed slope of the Lėvuo River is 0.52 m/km. The Lėvuo River bed slope in the reach from the source to the Akmeniai HPP (case study II, Fig. 2) is 0.62 m/km; while from Akmeniai HPP to the mouth – 0.45 m/km.

Three river types have been identified within the Lėvuo River. The reach of the Mūša River from the source to the beginning of Akmeniai HPP reservoir is classified as the water body of types 1 and 3; the reach from Akmeniai HPP reservoir to the river mouth is classified as the water body of type 5 (Lielupė River Basin District Management Plan, 2010).

The Lėvuo River basin is dominated by loams and sandy soils.

1 small hydropower plant is constructed on the Lėvuo River. The river reach below Akmeniai HPP is selected as a case study II.

Case study II (Fig. 1). The hydropower plant of this study is Akmeniai HPP (constructed in 1999) on the Lėvuo River, which is the largest tributary of Mūša River. Akmeniai HPP is located 38.7 km upstream the Bernatoniai WGS and 23.4 km downstream Kupškis WGS.

The surrounding area is a morainic plain, consisting of sandy loams. The valley of the river is not clearly expressed. The slopes of the valley are low, gradually moving to the surrounding plains, composed of sandy loams. A floodplain at the

right bank is 400 m of width. The riverbed is sandy, rocky, overgrown with abundant aquatic vegetation. The banks of the river are flat, sandy loamy, covered with bushes.

Hydrological regime of the Lévuo River at Bernatoniai WGS is characterised by high spring flood, long-term summer low flow and rain floods during autumn and winter seasons (Fig. 3). Water discharge data of the Bernatoniai WGS were analysed for preparation of runoff hydrographs of Lévuo River. Typical runoff hydrographs were created for wet, normal and dry years (Fig. 3.), on the basis of daily discharges (Annex I, Table 4-6).

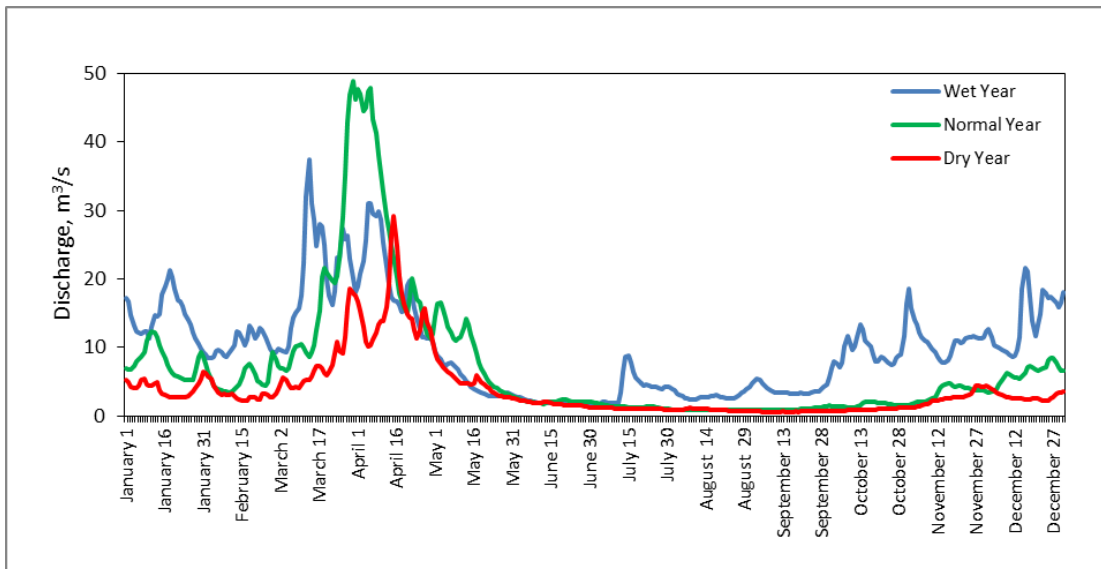


Figure 3. Hydrographs of Wet, Normal and Dry Years, Lévuo River-Bernatoniai WGS

Hydrographs of the Lévuo River - Bernatoniai WGS (Fig. 3) illustrate large runoff differences between wet and dry year not only in spring and autumn, but in summer low flow period as well. The exceptional feature of Lévuo River hydrographs is that the spring flood in wet year is much lower than in normal years. Low flow period lasts very long time, from May to November in the normal and dry years, while during wet years, it is very shorter (from middle May to the end of first decade of July). In wet years, the runoff increases significantly in the second half

of summer due to frequent rain. In autumn and winter periods, the water discharges of the river are higher than in summer, especially in wet years.

Suosa River

The Suosa River is the left tributary of Lėvuo River. The source of the river is Lake Suosa (the catchment area – 28.1 km²), situated at the altitude of 101.1 m above sea level. The total length of the Suosa River is 13.9 km, the catchment area – 96.8 km². The average bed slope of the river is 2.74 m/km. The surrounding area is an open plain of the Mūša-Nemunėlis Lowland, covered with loams. A Lake Suosa (Jurgiškis), the source of the Suosa River, is situated in the Viešintai ridge. At the middle reaches the river flows in the plain and at the lower reaches it crosses the end of ridge and enters into the deep valley of the Lėvuo River. Stirniškiai hydropower plant on the Suosa River was selected as case study III.

Case study III (Fig. 1). The hydropower plant of this case study is Stirniškiai HPP. It was constructed in 2006, on previously (in 1974) created reservoir. Stirniškiai HPP is located 1.8 km from the Suosa River mouth.

The hydrological measurements in the Suosa River have not ever been carried out. Therefore, the analogue method of estimating water discharge was used for the Suosa River. Daily discharges of the Virinta River at Viliaudiškis WGS were used for the creation of typical hydrographs of the Suosa River.

Hydrological regime of the Suosa River is characterized by high spring flood, low summer flow and low rain floods during autumn and winter seasons. Typical runoff hydrographs of the Susa River were created for wet, normal and dry years (Fig. 4) on the basis of daily discharges (Annex I, Tables 7-9).

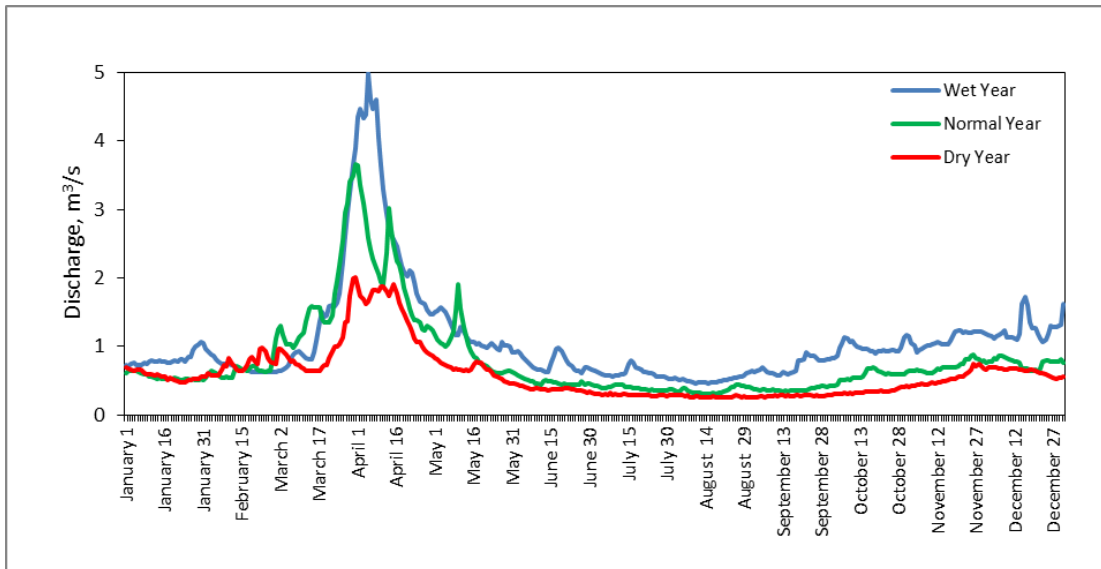


Figure 4. Hydrographs of Wet, Normal and Dry Years, Suosa River

Hydrographs of the Suosa River (Fig. 4), created according to the discharges of analogue (the Virinta River at Viliaudiškis) indicate that in the Suosa River at Stirniškiai HPP, the highest runoff is during spring flood, especially during wet years. The spring flood of normal years lasts longer than in wet or dry years and has 3 peaks. Low flow period lasts from June to October. The runoff of wet years during entire low flow period is higher due to frequent rains.

III. CONCLUSION

Prepared river hydrographs are going to be used for an assessment of e-flow patterns in Lielupé RBD.

ANNEX I

Table 1. Wet year daily discharge (m³/s), Mūša River – Ustukiai WGS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	13.8	8.0	8.2	94.9	16.0	5.4	4.1	6.4	12.2	7.0	38.0	17.1
2	12.6	7.7	7.9	96.7	14.1	5.8	3.7	5.9	10.4	6.6	37.1	16.7
3	12.2	7.2	7.5	85.2	12.2	6.7	3.9	5.5	10.2	6.3	35.0	15.3
4	11.9	7.0	7.4	85.2	11.5	8.1	4.6	5.0	9.3	6.8	30.7	16.1
5	12.9	6.7	8.8	82.9	11.5	6.8	6.0	4.9	8.8	9.4	27.3	17.5
6	13.2	6.3	9.1	80.7	12.2	5.3	6.4	4.9	9.3	10.3	22.1	19.3
7	13.1	6.1	9.8	80.3	11.9	4.8	5.9	4.7	8.7	11.5	21.5	20.5
8	13.2	5.9	10.4	78.8	11.7	4.4	5.4	4.4	8.1	12.8	21.9	19.6
9	13.5	6.0	12.3	77.4	11.9	4.2	4.9	4.3	7.7	11.8	22.8	17.3
10	12.6	6.4	13.3	69.8	12.0	4.0	4.7	4.6	5.9	13.8	22.3	14.9
11	12.1	9.3	15.1	62.3	10.9	4.1	5.9	4.7	6.1	16.5	21.2	16.7
12	11.6	13.2	22.0	51.6	10.2	3.2	9.7	4.6	6.3	19.5	20.5	21.9
13	11.5	15.6	25.7	45.3	10.2	3.7	13.9	4.7	6.0	20.5	19.4	24.8
14	13.6	9.8	29.5	40.5	9.8	4.3	18.7	4.8	5.5	21.2	16.0	30.3
15	13.8	14.5	28.1	33.9	11.5	5.1	17.5	10.5	5.2	20.8	14.4	37.8
16	14.9	14.1	27.8	27.4	14.8	5.4	14.9	9.8	6.8	21.6	13.1	36.2
17	16.7	15.7	26.2	30.8	14.8	5.6	11.8	6.2	5.8	22.9	12.7	29.9
18	17.2	15.1	21.9	31.5	13.6	6.4	10.2	5.3	6.1	22.7	13.5	25.5
19	17.5	15.4	20.5	29.7	12.1	7.1	8.3	5.8	7.3	22.5	14.8	24.2
20	17.4	14.8	20.7	31.3	9.2	6.1	7.6	6.8	6.5	21.3	16.4	24.1
21	16.3	13.9	21.0	37.5	10.2	4.8	7.0	5.7	6.0	18.6	17.4	24.2
22	14.3	12.8	23.0	45.0	12.2	4.6	7.1	5.0	5.6	16.9	16.9	31.8
23	12.7	12.0	23.5	41.1	10.7	4.4	6.9	4.8	5.5	14.9	16.7	34.1
24	11.6	11.0	30.4	28.0	9.9	3.5	7.1	4.9	5.4	13.6	17.2	34.8
25	11.4	10.1	40.9	23.4	8.1	3.4	6.8	5.8	5.4	12.8	15.5	31.4
26	10.9	9.3	50.9	22.7	7.5	4.0	6.0	7.7	5.8	12.5	15.4	34.0
27	10.3	8.7	57.4	24.2	5.6	4.5	5.5	9.4	6.9	12.0	15.4	30.2
28	9.3	8.3	52.5	22.2	5.1	5.1	5.0	10.3	7.8	12.4	15.3	29.4
29	8.8		52.5	21.8	5.0	5.1	5.8	10.5	7.7	14.1	15.9	32.2
30	9.1		65.1	18.6	4.8	4.7	6.1	11.9	7.4	20.7	16.7	34.7
31	8.6		81.5		4.9		6.6	12.6		31.8		33.4

Table 2. Normal year daily discharge (m³/s), Mūša River – Ustukiai WGS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	23.6	7.2	39.3	37.2	11.7	5.9	3.3	2.5	2.0	2.3	3.2	8.5
2	22.0	7.4	33.4	38.6	10.5	6.0	3.2	2.4	2.0	2.2	3.1	7.9
3	21.2	7.8	28.5	36.0	9.9	5.9	3.1	2.3	1.9	2.2	3.2	7.8
4	20.4	7.8	24.4	31.7	9.3	5.5	3.0	2.2	1.9	2.2	3.6	7.8
5	24.9	8.3	22.8	27.0	8.3	5.5	2.8	2.8	1.8	2.8	3.7	8.5
6	24.9	8.5	23.9	23.0	9.6	5.4	2.7	3.6	1.9	2.4	4.0	8.7
7	25.4	8.8	22.6	22.0	10.1	5.3	2.5	3.3	1.9	2.1	5.2	8.2
8	25.9	10.0	25.1	20.7	10.9	5.0	2.5	2.4	2.1	2.2	5.6	7.6
9	25.0	11.6	30.6	19.5	11.4	4.7	2.5	2.0	2.5	2.2	6.4	8.3
10	25.0	12.5	30.6	19.2	10.9	4.3	2.4	2.1	2.8	2.2	7.0	8.8
11	23.3	12.7	27.8	18.9	10.6	4.0	2.4	2.0	2.9	2.3	7.9	9.8
12	21.8	13.6	24.8	18.9	11.7	3.9	2.4	1.9	2.8	2.6	7.7	10.0
13	19.1	14.3	23.9	19.0	12.0	3.9	2.4	1.8	3.1	3.2	7.8	10.4
14	18.2	14.8	23.4	18.2	10.9	3.7	2.3	1.9	4.3	3.3	7.7	10.5
15	16.0	15.2	24.7	17.6	8.9	4.7	2.3	1.9	4.9	3.5	9.3	9.8
16	15.9	13.9	30.1	16.5	7.9	3.6	2.4	1.8	3.7	3.6	9.2	9.4
17	15.7	13.2	35.8	15.8	7.0	3.3	2.4	1.7	3.3	3.3	9.9	9.6
18	12.9	12.1	36.7	15.2	6.1	3.4	2.4	1.6	3.2	3.2	9.9	9.9
19	13.0	10.5	33.5	17.0	5.6	4.0	2.4	1.6	3.1	3.1	9.8	10.3
20	11.6	10.1	29.6	21.4	5.4	4.5	2.4	1.5	2.8	2.9	9.4	10.5
21	10.6	9.6	25.2	22.5	4.9	4.9	2.4	1.5	2.7	2.8	9.9	11.4
22	10.3	9.1	22.7	21.3	4.9	5.2	2.5	1.7	2.4	2.7	9.8	12.1
23	9.8	9.1	21.1	21.4	5.2	4.7	2.9	2.0	2.4	2.7	10.1	14.3
24	9.5	9.4	20.7	22.3	5.2	4.5	2.9	2.2	2.4	2.9	8.8	15.7
25	8.5	10.0	20.8	20.3	4.8	3.8	2.7	2.2	2.5	3.4	8.1	15.8
26	8.2	12.7	21.8	17.8	4.5	3.7	2.7	2.2	2.4	3.8	9.8	17.9
27	7.9	18.7	23.6	15.6	4.1	3.8	2.7	2.1	2.5	4.1	12.2	21.0
28	7.6	31.8	24.6	14.1	3.9	3.8	2.5	2.2	2.5	4.0	11.8	24.1
29	7.4		28.7	12.8	3.8	3.7	2.8	2.3	2.4	3.9	10.8	24.3
30	7.2		31.2	12.1	3.8	3.5	2.7	2.2	2.3	3.6	9.4	25.5
31	7.4		35.3		4.3		2.6	2.1		3.4		29.4

Table 3. Dry year daily discharge (m³/s), Mūša River – Ustukiai WGS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	3.8	4.2	7.3	30.2	14.3	4.0	1.8	1.2	1.7	1.5	2.3	7.6
2	3.2	4.7	5.8	31.5	11.6	3.5	1.7	1.1	1.7	1.3	2.4	9.1
3	3.1	4.2	5.0	26.2	9.5	3.2	1.7	1.1	1.6	1.4	2.5	8.9
4	4.1	3.8	4.6	22.4	8.4	3.0	2.0	1.1	1.5	1.4	2.6	8.2
5	3.2	3.6	4.0	22.5	7.7	2.7	2.1	1.1	1.4	1.4	3.0	7.0
6	3.1	3.8	3.8	19.6	7.2	2.5	2.0	1.1	1.3	1.5	3.1	6.7
7	3.0	3.7	3.4	24.1	6.8	2.2	2.0	1.1	1.2	1.5	3.3	5.9
8	3.0	4.1	3.3	22.5	6.5	2.1	2.0	1.1	1.2	1.5	3.7	5.1
9	2.9	4.3	3.3	20.4	6.2	2.1	2.0	1.2	1.2	1.5	4.1	4.6
10	2.9	4.9	3.1	18.9	5.9	2.4	2.0	1.1	1.2	1.5	4.0	5.0
11	2.7	4.3	3.4	18.8	5.3	2.7	2.1	1.1	1.3	1.5	4.0	4.7
12	2.8	4.1	3.0	17.5	4.9	2.4	2.1	1.1	1.3	1.4	3.8	4.7
13	2.8	3.6	2.8	18.8	4.8	2.9	2.1	1.1	1.3	1.4	3.5	4.9
14	2.8	3.3	2.7	22.1	4.6	2.9	2.1	1.0	1.2	1.5	3.7	5.1
15	2.7	3.2	3.1	30.7	4.5	2.6	2.2	1.0	1.2	1.6	4.0	5.0
16	2.6	3.0	3.2	43.2	4.4	2.5	2.2	1.0	1.2	1.8	4.4	4.7
17	2.2	3.1	2.9	46.6	4.4	2.4	2.3	1.0	1.3	2.5	4.6	4.5
18	2.2	3.1	3.2	43.0	4.5	2.3	2.1	1.0	1.3	3.6	4.2	4.4
19	2.1	4.0	4.0	36.5	4.6	2.4	2.1	1.0	1.3	4.1	4.1	4.3
20	2.2	4.1	4.0	32.1	4.8	2.4	2.0	1.0	1.2	4.8	3.9	4.3
21	2.2	4.0	5.7	26.2	4.7	2.3	1.9	1.0	1.2	4.3	3.7	4.4
22	2.3	5.3	8.3	21.2	4.7	2.4	1.8	1.0	1.3	3.9	3.5	4.4
23	2.4	6.3	12.0	18.5	4.6	2.5	1.7	1.0	1.4	3.6	3.4	4.1
24	2.6	7.7	10.4	15.7	4.3	2.4	1.7	1.0	1.4	3.5	3.5	4.0
25	2.7	6.7	10.6	18.0	4.2	2.4	1.6	1.2	1.4	3.4	4.0	4.2
26	2.8	5.9	11.8	23.3	4.2	2.4	1.5	1.5	1.6	3.6	4.3	3.9
27	2.7	6.3	15.5	21.1	4.2	2.2	1.4	1.4	1.6	3.4	4.3	3.3
28	2.9	5.7	17.8	18.5	4.5	2.2	1.3	1.3	1.8	3.2	4.1	3.1
29	3.8		21.6	18.7	4.6	2.0	1.3	1.4	2.3	3.1	4.7	3.4
30	3.9		30.1	17.0	4.0	1.9	1.2	1.5	2.2	3.0	6.2	3.2
31	4.0		33.8		4.1		1.2	1.7		2.6		3.6

Table 4. Wet year daily discharge (m³/s), Lévuo River – Bernatoniai WGS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	17.3	8.91	9.75	18.9	9.55	2.95	1.45	3.97	4.69	5.58	18.5	12.4
2	16.7	8.54	9.69	20.7	8.87	2.79	1.48	3.67	5.11	6.96	15.7	12.7
3	14.8	8.42	9.55	22.6	8.22	2.67	1.65	3.30	5.41	7.93	14.0	11.5
4	13.2	8.62	9.30	25.6	7.63	2.51	1.80	3.04	5.32	7.64	13.3	10.4
5	12.4	9.39	10.2	31.0	7.23	2.35	2.01	2.85	4.81	7.06	12.2	10.2
6	12.1	9.58	12.8	31.0	7.65	2.25	1.98	2.63	4.39	7.84	11.5	10.0
7	12.0	9.29	14.3	29.4	7.80	2.17	1.97	2.50	4.01	10.1	11.0	9.67
8	12.3	8.88	15.0	29.1	7.44	2.12	1.90	2.42	3.75	11.6	10.8	9.49
9	12.4	8.61	15.7	29.9	7.14	2.01	1.87	2.40	3.51	10.6	10.3	9.32
10	11.3	9.09	17.5	28.7	6.70	1.93	1.88	2.36	3.43	9.64	9.78	8.93
11	12.9	9.76	22.3	25.3	6.14	1.97	1.97	2.59	3.35	10.2	9.24	8.65
12	14.7	10.4	32.1	21.7	5.56	2.08	3.33	2.78	3.41	11.4	8.60	8.75
13	14.6	12.4	37.3	19.2	5.17	2.07	6.46	2.75	3.40	13.3	8.15	9.63
14	14.9	12.1	31.1	17.4	4.70	1.94	8.55	2.71	3.38	12.6	7.82	11.5
15	17.7	11.2	28.6	16.9	4.20	1.92	8.74	2.68	3.33	11.1	7.82	18.6
16	18.9	10.4	24.8	16.7	3.95	1.82	7.73	2.88	3.32	10.6	8.18	21.6
17	19.9	11.1	28.0	16.2	3.76	1.77	6.51	2.98	3.30	10.2	8.86	21.0
18	21.2	13.1	27.6	15.2	3.61	1.75	5.58	3.01	3.28	8.95	9.98	17.4
19	20.2	12.7	25.0	15.3	3.47	1.70	5.09	2.96	3.32	8.00	11.0	13.9
20	18.5	11.4	19.8	19.1	3.28	1.68	4.75	2.82	3.33	7.91	11.0	11.6
21	16.9	11.8	17.6	19.7	3.15	1.65	4.41	2.71	3.26	8.56	10.6	13.3
22	16.6	12.9	16.1	17.5	2.98	1.64	4.53	2.59	3.24	8.40	10.8	14.9
23	16.0	12.5	18.2	15.6	2.86	1.62	4.44	2.55	3.30	8.21	11.3	18.4
24	14.8	11.5	23.0	14.3	2.84	1.63	4.22	2.57	3.49	7.77	11.5	17.8
25	14.0	10.7	23.0	12.7	2.91	1.59	4.28	2.53	3.56	7.46	11.5	17.2
26	13.4	9.82	27.4	11.5	2.91	1.56	4.23	2.76	3.53	7.67	11.6	17.4
27	12.2	9.27	25.9	11.5	2.96	1.56	4.05	3.09	3.64	8.43	11.5	17.1
28	11.4	9.26	26.4	11.3	3.20	1.53	3.89	3.34	3.83	8.81	11.2	16.5
29	10.5		23.0	11.4	3.37	1.50	4.26	3.61	4.18	9.03	11.2	15.8
30	9.85		20.1	10.9	3.24	1.49	4.33	3.89	4.67	11.7	11.4	16.6
31	9.26		18.1		3.06		4.19	4.30		16.4		18.1

Table 5. Normal year daily discharge (m³/s), Lévuo River – Bernatoniai WGS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	6.96	7.67	7.32	47.7	14.5	2.74	2.02	0.97	0.85	1.49	1.61	3.65
2	6.86	6.42	7.00	47.0	16.3	2.57	1.95	0.94	0.87	1.47	1.72	3.45
3	6.75	5.32	6.90	44.5	16.5	2.42	1.84	0.92	0.84	1.44	1.90	3.52
4	7.24	4.50	6.54	45.0	15.6	2.27	1.74	0.88	0.86	1.41	2.01	3.65
5	7.93	4.17	6.88	47.4	14.3	2.18	1.65	0.86	0.87	1.39	2.10	3.94
6	8.24	3.89	8.25	47.9	12.9	2.09	1.56	0.86	0.86	1.36	2.07	4.63
7	8.65	3.74	9.48	43.3	12.1	2.06	1.49	0.85	0.87	1.33	2.14	5.31
8	9.27	3.63	10.2	41.3	11.3	1.98	1.43	0.85	0.89	1.30	2.31	5.80
9	10.9	3.50	10.3	38.2	10.9	1.93	1.38	0.88	0.85	1.29	2.39	6.24
10	11.8	3.45	10.4	35.5	11.3	1.89	1.43	0.87	0.85	1.30	2.55	6.12
11	12.4	3.64	9.95	32.6	11.6	1.85	1.47	0.84	0.90	1.31	2.80	5.82
12	12.2	3.86	9.34	29.0	12.9	1.80	1.46	0.84	0.87	1.36	3.46	5.61
13	11.6	4.25	8.57	27.2	14.1	1.90	1.41	0.84	0.86	1.58	4.11	5.54
14	10.3	4.65	9.22	24.9	13.4	2.04	1.35	0.87	0.87	1.94	4.40	5.49
15	9.50	5.77	10.2	23.2	11.9	1.99	1.31	0.86	0.90	2.07	4.63	5.76
16	8.54	6.89	12.4	20.2	10.3	2.01	1.26	0.86	0.91	2.05	4.76	6.32
17	7.52	7.35	15.4	18.0	9.17	2.08	1.23	0.86	0.94	2.05	4.69	7.08
18	6.73	7.54	20.2	16.8	7.72	2.23	1.23	0.85	0.95	2.03	4.45	7.29
19	6.33	7.16	21.5	15.8	6.89	2.40	1.25	0.86	0.97	1.98	4.29	7.05
20	5.97	6.02	21.0	15.0	6.09	2.39	1.24	0.86	0.98	1.89	4.41	6.71
21	5.73	5.09	20.5	17.2	5.47	2.33	1.28	0.84	1.00	1.95	4.42	6.67
22	5.56	4.88	19.8	20.2	4.98	2.22	1.34	0.84	1.04	1.92	4.28	6.84
23	5.38	4.63	19.4	18.7	4.59	2.09	1.39	0.85	1.07	1.82	4.14	7.01
24	5.32	4.39	20.4	17.0	4.25	2.04	1.39	0.86	1.11	1.71	4.05	7.11
25	5.29	4.86	23.0	16.5	4.02	2.04	1.32	0.90	1.15	1.67	3.87	8.07
26	5.21	7.43	29.0	14.9	3.82	2.09	1.24	0.86	1.19	1.64	3.76	8.39
27	5.29	9.24	35.0	13.2	3.59	2.07	1.17	0.86	1.24	1.61	3.72	8.52
28	6.49	8.24	42.8	12.0	3.37	2.06	1.08	0.86	1.27	1.60	3.70	7.74
29	8.59		46.8	11.3	3.17	2.03	1.06	0.89	1.36	1.60	3.76	7.08
30	9.23		48.8	12.0	3.00	2.06	1.03	0.89	1.45	1.60	3.77	6.58
31	8.69		46.1		2.85		1.00	0.86		1.60		6.53

Table 6. Dry year daily discharge (m³/s), Lévuo River – Bernatoniai WGS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	5.28	6.23	3.94	16.6	9.38	2.52	1.25	0.95	0.69	0.74	1.22	4.42
2	4.88	5.82	4.70	15.3	8.30	2.39	1.21	0.95	0.67	0.74	1.27	4.27
3	4.30	5.37	5.60	13.0	7.56	2.31	1.19	0.92	0.65	0.75	1.31	3.85
4	4.08	4.37	5.35	10.9	7.05	2.28	1.15	0.94	0.64	0.76	1.34	3.68
5	4.15	3.92	4.62	10.1	6.74	2.25	1.18	0.94	0.62	0.80	1.42	3.48
6	4.34	3.44	4.14	10.4	6.38	2.12	1.22	0.98	0.61	0.80	1.56	3.27
7	5.20	3.05	4.13	11.1	6.08	2.06	1.19	1.10	0.60	0.80	1.68	3.10
8	5.39	3.17	4.20	12.2	5.82	1.98	1.16	1.19	0.59	0.81	1.80	2.91
9	4.60	3.06	4.14	13.3	5.41	1.92	1.15	1.12	0.60	0.82	1.94	2.80
10	4.38	2.99	4.51	13.9	5.03	1.85	1.13	1.11	0.61	0.82	2.24	2.75
11	4.39	3.31	5.03	13.8	4.79	1.93	1.13	1.07	0.60	0.82	2.24	2.62
12	4.72	2.83	5.23	15.9	4.69	1.98	1.12	1.04	0.62	0.82	2.29	2.56
13	4.91	2.60	5.32	19.1	4.75	2.09	1.10	1.03	0.64	0.82	2.33	2.57
14	3.73	2.45	5.76	26.2	4.79	2.02	1.08	1.01	0.61	0.82	2.39	2.54
15	3.30	2.30	6.64	29.1	4.65	1.88	1.10	0.98	0.62	0.83	2.53	2.52
16	3.11	2.22	7.34	24.9	4.80	1.80	1.09	0.96	0.62	0.84	2.65	2.44
17	2.92	2.31	7.36	20.3	5.90	1.75	1.10	0.91	0.63	0.84	2.62	2.40
18	2.77	2.73	6.98	18.0	5.50	1.75	1.09	0.86	0.64	0.87	2.68	2.44
19	2.69	2.81	6.34	16.4	4.96	1.68	1.06	0.86	0.63	0.92	2.68	2.58
20	2.66	2.74	5.99	14.9	4.57	1.63	1.06	0.85	0.64	0.99	2.69	2.53
21	2.72	2.45	6.38	14.3	4.18	1.62	1.03	0.83	0.65	1.03	2.68	2.51
22	2.76	2.42	7.42	14.1	4.01	1.57	1.05	0.81	0.66	1.03	2.75	2.38
23	2.67	3.28	9.17	12.5	3.63	1.57	1.07	0.78	0.68	1.04	2.89	2.26
24	2.69	3.25	10.8	11.2	3.37	1.56	1.06	0.77	0.69	1.07	3.01	2.26
25	2.82	3.02	9.43	12.5	3.11	1.52	1.04	0.74	0.69	1.07	3.26	2.25
26	3.26	2.70	9.20	15.0	2.98	1.53	1.03	0.72	0.69	1.09	3.79	2.50
27	3.61	2.77	11.5	15.6	2.85	1.51	1.00	0.72	0.70	1.11	4.39	2.82
28	4.04	3.21	15.8	13.7	2.81	1.44	0.98	0.71	0.72	1.14	4.37	3.21
29	4.78		18.5	12.5	2.73	1.36	0.94	0.70	0.72	1.16	4.24	3.46
30	5.39		17.9	10.9	2.72	1.29	0.96	0.70	0.72	1.17	4.21	3.49
31	6.49		17.5		2.61		0.95	0.70		1.21		3.50

Table 7. Wet year daily discharge (m³/s), Suosa River – Stirniškiai HPP

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	0.73	0.97	0.64	4.35	1.49	0.92	0.67	0.53	0.64	0.82	1.14	1.18
2	0.71	0.93	0.64	4.47	1.53	0.93	0.65	0.54	0.63	0.83	1.06	1.17
3	0.74	0.88	0.65	4.34	1.57	0.90	0.63	0.52	0.64	0.84	1.01	1.14
4	0.75	0.86	0.69	4.39	1.53	0.84	0.61	0.52	0.66	0.87	0.91	1.11
5	0.72	0.81	0.73	4.99	1.50	0.82	0.60	0.52	0.70	0.99	0.95	1.15
6	0.73	0.78	0.84	4.62	1.43	0.77	0.58	0.50	0.66	1.05	0.97	1.17
7	0.73	0.74	0.89	4.47	1.32	0.73	0.58	0.49	0.63	1.13	1.00	1.21
8	0.76	0.74	0.91	4.60	1.23	0.69	0.58	0.49	0.61	1.11	1.01	1.23
9	0.75	0.75	0.93	4.05	1.17	0.69	0.57	0.48	0.60	1.06	1.02	1.13
10	0.79	0.75	0.90	3.64	1.16	0.67	0.57	0.47	0.59	1.09	1.02	1.13
11	0.79	0.74	0.87	3.29	1.28	0.66	0.58	0.47	0.58	1.03	1.05	1.14
12	0.78	0.71	0.83	2.94	1.22	0.64	0.60	0.47	0.58	1.00	1.06	1.11
13	0.79	0.68	0.82	2.74	1.15	0.63	0.59	0.47	0.63	0.98	1.05	1.09
14	0.79	0.66	0.81	2.63	1.11	0.62	0.62	0.47	0.62	0.96	1.04	1.18
15	0.78	0.66	0.92	2.57	1.07	0.78	0.75	0.46	0.60	0.96	1.03	1.62
16	0.77	0.66	1.07	2.46	1.07	0.87	0.80	0.47	0.61	0.96	1.03	1.73
17	0.76	0.65	1.37	2.31	1.04	0.97	0.75	0.48	0.62	0.93	1.08	1.61
18	0.76	0.64	1.50	2.18	1.05	0.98	0.69	0.48	0.64	0.92	1.14	1.35
19	0.78	0.63	1.44	2.09	1.02	0.93	0.67	0.49	0.79	0.90	1.22	1.26
20	0.79	0.63	1.45	2.02	0.99	0.87	0.66	0.49	0.79	0.94	1.23	1.26
21	0.79	0.63	1.59	2.11	0.98	0.80	0.63	0.50	0.82	0.93	1.23	1.19
22	0.82	0.62	1.60	2.07	1.01	0.75	0.62	0.52	0.92	0.94	1.20	1.11
23	0.82	0.63	1.59	1.95	1.05	0.70	0.61	0.52	0.88	0.94	1.21	1.07
24	0.78	0.62	1.63	1.78	1.01	0.66	0.60	0.53	0.86	0.92	1.19	1.11
25	0.84	0.63	1.77	1.65	0.96	0.64	0.59	0.54	0.86	0.95	1.20	1.18
26	0.85	0.63	2.25	1.64	0.94	0.64	0.56	0.55	0.83	0.94	1.21	1.30
27	0.94	0.63	2.62	1.62	1.06	0.61	0.56	0.56	0.79	0.93	1.22	1.28
28	0.99	0.63	2.94	1.53	1.02	0.69	0.56	0.55	0.79	0.92	1.22	1.29
29	1.04		3.23	1.47	1.02	0.69	0.56	0.58	0.79	0.98	1.21	1.29
30	1.07		3.65	1.47	1.00	0.68	0.55	0.61	0.81	1.14	1.20	1.32
31	1.05		3.89		0.92		0.53	0.63		1.16		1.62

Table 8. Normal year daily discharge (m³/s), Suosa River – Stirniškiai HPP

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	0.61	0.54	1.25	3.63	1.17	0.62	0.45	0.37	0.39	0.43	0.64	0.77
2	0.64	0.59	1.31	3.35	1.10	0.58	0.43	0.36	0.37	0.42	0.64	0.77
3	0.64	0.64	1.16	3.08	1.05	0.56	0.42	0.35	0.37	0.43	0.65	0.78
4	0.64	0.63	1.03	2.86	1.03	0.55	0.41	0.34	0.35	0.44	0.65	0.82
5	0.65	0.62	1.03	2.59	1.00	0.53	0.40	0.39	0.37	0.51	0.65	0.81
6	0.62	0.57	1.04	2.40	1.02	0.51	0.40	0.40	0.37	0.52	0.64	0.87
7	0.62	0.55	0.98	2.28	1.14	0.50	0.41	0.37	0.36	0.52	0.63	0.87
8	0.60	0.55	1.03	2.14	1.22	0.49	0.40	0.34	0.35	0.53	0.61	0.84
9	0.59	0.55	1.13	2.05	1.52	0.47	0.42	0.33	0.37	0.51	0.61	0.83
10	0.57	0.54	1.17	1.95	1.91	0.46	0.43	0.32	0.36	0.55	0.61	0.81
11	0.55	0.55	1.20	1.91	1.55	0.45	0.43	0.32	0.35	0.54	0.64	0.79
12	0.54	0.65	1.37	2.36	1.29	0.49	0.43	0.32	0.37	0.55	0.67	0.79
13	0.53	0.71	1.55	3.01	1.15	0.52	0.44	0.30	0.35	0.54	0.67	0.79
14	0.54	0.69	1.59	2.70	1.02	0.50	0.42	0.31	0.36	0.56	0.69	0.75
15	0.52	0.66	1.57	2.48	0.93	0.50	0.42	0.31	0.34	0.61	0.69	0.68
16	0.53	0.66	1.56	2.25	0.85	0.48	0.40	0.31	0.36	0.67	0.69	0.67
17	0.52	0.65	1.57	2.19	0.82	0.47	0.39	0.32	0.36	0.68	0.70	0.67
18	0.53	0.67	1.41	2.06	0.77	0.46	0.40	0.31	0.36	0.69	0.70	0.64
19	0.52	0.72	1.35	1.86	0.75	0.44	0.38	0.33	0.35	0.67	0.69	0.64
20	0.54	0.71	1.36	1.69	0.73	0.45	0.38	0.33	0.36	0.65	0.72	0.67
21	0.53	0.65	1.34	1.55	0.70	0.44	0.37	0.34	0.36	0.62	0.74	0.63
22	0.52	0.64	1.45	1.46	0.68	0.44	0.37	0.35	0.37	0.60	0.75	0.67
23	0.51	0.65	1.77	1.38	0.64	0.44	0.36	0.37	0.38	0.59	0.80	0.77
24	0.53	0.62	1.95	1.39	0.62	0.44	0.37	0.40	0.38	0.61	0.81	0.80
25	0.52	0.64	2.18	1.35	0.62	0.44	0.35	0.41	0.39	0.59	0.87	0.80
26	0.51	0.65	2.55	1.26	0.61	0.44	0.36	0.45	0.41	0.60	0.87	0.78
27	0.52	0.80	2.96	1.23	0.62	0.49	0.36	0.44	0.42	0.60	0.83	0.78
28	0.51	1.12	3.08	1.29	0.63	0.45	0.36	0.42	0.43	0.60	0.81	0.77
29	0.52		3.40	1.26	0.64	0.46	0.36	0.43	0.42	0.59	0.78	0.77
30	0.52		3.49	1.23	0.64	0.46	0.36	0.41	0.41	0.59	0.79	0.82
31	0.51		3.66		0.63		0.37	0.41		0.63		0.76

Table 9. Dry year daily discharge (m³/s), Suosa River – Stirniškiai HPP

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
1	0.70	0.56	0.97	1.87	0.83	0.46	0.33	0.29	0.26	0.29	0.41	0.67
2	0.68	0.62	0.97	1.74	0.80	0.44	0.31	0.28	0.26	0.28	0.42	0.69
3	0.65	0.58	0.93	1.69	0.76	0.43	0.31	0.29	0.26	0.30	0.42	0.69
4	0.64	0.58	0.88	1.63	0.75	0.42	0.31	0.29	0.27	0.30	0.44	0.70
5	0.66	0.58	0.83	1.65	0.73	0.41	0.29	0.29	0.27	0.31	0.44	0.69
6	0.66	0.58	0.78	1.74	0.71	0.40	0.31	0.28	0.26	0.31	0.46	0.67
7	0.66	0.66	0.79	1.83	0.70	0.37	0.29	0.28	0.28	0.32	0.44	0.67
8	0.60	0.73	0.75	1.83	0.67	0.37	0.32	0.26	0.27	0.31	0.44	0.66
9	0.60	0.71	0.72	1.81	0.67	0.39	0.29	0.26	0.28	0.32	0.46	0.66
10	0.59	0.83	0.69	1.87	0.66	0.38	0.30	0.27	0.29	0.31	0.48	0.67
11	0.60	0.75	0.68	1.88	0.65	0.38	0.29	0.28	0.28	0.33	0.47	0.67
12	0.57	0.71	0.64	1.81	0.65	0.38	0.29	0.25	0.29	0.33	0.47	0.68
13	0.59	0.65	0.65	1.75	0.66	0.37	0.30	0.26	0.28	0.32	0.48	0.67
14	0.57	0.64	0.65	1.83	0.65	0.36	0.30	0.26	0.28	0.32	0.48	0.66
15	0.55	0.65	0.65	1.90	0.66	0.37	0.29	0.26	0.28	0.34	0.50	0.66
16	0.56	0.68	0.65	1.77	0.74	0.38	0.30	0.26	0.28	0.33	0.50	0.64
17	0.50	0.73	0.65	1.64	0.77	0.38	0.29	0.27	0.28	0.35	0.53	0.65
18	0.54	0.81	0.70	1.56	0.76	0.38	0.29	0.26	0.29	0.34	0.53	0.66
19	0.52	0.84	0.73	1.48	0.76	0.38	0.29	0.25	0.28	0.34	0.53	0.67
20	0.51	0.78	0.73	1.36	0.70	0.38	0.29	0.26	0.28	0.34	0.55	0.64
21	0.50	0.75	0.83	1.30	0.66	0.39	0.29	0.26	0.28	0.36	0.56	0.63
22	0.48	0.96	0.92	1.22	0.66	0.39	0.29	0.26	0.29	0.35	0.56	0.61
23	0.47	0.98	1.01	1.12	0.62	0.37	0.28	0.26	0.29	0.35	0.59	0.62
24	0.48	0.93	0.99	1.06	0.58	0.37	0.28	0.26	0.29	0.35	0.62	0.59
25	0.51	0.83	1.04	1.07	0.56	0.35	0.28	0.28	0.28	0.35	0.66	0.57
26	0.51	0.77	1.13	0.99	0.54	0.36	0.28	0.28	0.29	0.36	0.75	0.56
27	0.52	0.75	1.34	0.94	0.52	0.36	0.29	0.27	0.28	0.37	0.71	0.54
28	0.53	0.75	1.36	0.92	0.49	0.34	0.29	0.26	0.27	0.39	0.74	0.53
29	0.53		1.74	0.88	0.48	0.33	0.29	0.27	0.28	0.41	0.70	0.54
30	0.55		1.99	0.87	0.47	0.34	0.28	0.26	0.29	0.41	0.69	0.54
31	0.56		2.01		0.46		0.29	0.26		0.43		0.56