

Chapter 18

Precipitation Extremes and Disastrous Floods in Central Europe in July 1897

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18.1 Introduction

The high water of July 1897 which took place in nearly two thirds of the territory of Bohemia, Moravia and Silesia, Lower and Upper Austria, and a great part of Germany brought sights of apocalyptic destruction. Consequences of bitter floods in 1858 and 1882 having not yet faded away from the memory of inhabitants in the mountain areas which form a natural boundary between Bohemia and Silesia, the region was affected from 28 to 30 July 1897 by the precipitation of extreme intensity following after several days of rains (Hellmann 1897, Trabert 1897). All water courses in the Krkonoše Mts. rapidly overflowed the banks on both sides of the border and the process of destruction began.

18.2 Precipitation Extremes

The rain intensity reached its peak on 29 July 1897 after 8 p.m. Historical records describing the event of this night paint in bright emotionally the ghastly raging dark night falling down on the highest Czech mountains, evoking the image of the biblical Flood. Unlike the biblical event the high water of July 1897 entered the lives of many thousand people quite unexpectedly and without any warning. Especially the two main rivers – Labe (Elbe) and Úpa became dimensionless streams of water - sweeping, pulling down and taking away everything that was standing in their way.

While in the summer of 1997 the hitherto records of multiple-day total precipitation were exceeded in numerous localities in the Czech Republic, the 1-day total precipitation of 345.1 mm from 29 July 1897 gauged at the Nová Louka

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station (780 m a.s.l.) in the Jizerské hory Mts. (Polish: Góry Izerskie, German: Isergebirge) was not surmounted (Kakos 1997). The 24 h precipitation amount is likely to be at least a Central-European record until today. Although the 1-day total precipitation amounts of 300 mm and more are exceptional in Europe's climate, they were recorded two times in the summer of 1897: apart from the above mentioned 345.1 mm, a nearby gauging station Jizerka (formerly Wilhelmshöhe) in the Jizerské hory Mts. measured an amount of 300 mm on the same day (Table 18.1). Czerwiński (1998) mentioned as regional daily precipitation extreme during this synoptical situation 376 mm, but it is undoubtedly a mistake. On the Polish side was the greatest daily amount of precipitation 239 mm on the station Śnieżka (1603 m a.s.l.).

During the catastrophic floods in Central Europe in August 2002 a new absolute German national record was measured (312 mm/day) at the Zinnwald-Georgenfeld station (877 m a.s.l.) in the Ore Mts. (Czech: Krušné hory, German: Erzgebirge) from the morning of 12 to the morning of 13 August, i.e. with 34 mm still missing to surmount the Central-European extreme from 1897. In the Czech Lands was in August 2002 an extreme value "only" 278 mm on the station Knajpa (967 m a.s.l.) in special net of Czech Hydrometeorological Institute on 13 August 2002. In Poland is continually valid absolute one day precipitation record 300 mm from the station Hala Gąsienicowa (1520 m a.s.l.) in High Tatra Mts. on 30 June 1973 (Table 18.2).

As to the synoptic causes of the extreme precipitation, it was in fact the cyclone progressing along the Vb trajectory in the sense of van Bebber's classification. On 28 July 1897, an extensive low pressure zone developed over

Table 18.1 One-day total precipitation amounts from 29–30 July 1897 in the Czech-Polish borderland region

Amount [mm]	Date	Station	Altitude [m a.s.l.]	Country
345	29.7.1897	Nová Louka/Neuwiese	780	CZ
300	29.7.1897	Jizerka/Wilhelmshöhe	870	CZ
266	29.7.1897	Pecpod Sněžkou/Riesenhain	812	CZ
239	29.7.1897	Śnieżka/Schneekoppe	1603	PL
225	29.7.1897	Schronisko Księcia Henryka/ Prinz Heinrich Baude	1400	PL
220	29.7.1897	Kościół Wang/Kirche Wang	873	PL

Table 18.2 One-day precipitation records in Central Europe

Amount [mm]	Date	Station	Altitude [m a.s.l.]	Country
345	29.7.1897	Nová Louka	780	CZ
323	5.6.1947	Semmering	1012	A
312	12.8.2002	Zinnwald-Georgenfeld	877	D
300	30.6.1973	Hala Gąsienicowa	1520	PL
232	12.7.1957	Salka	111	SK

Central Europe, which had three cores (1,005 hPa): one above the northern part of the Adriatic sea, one above Hungary and one above southern Poland – that “merged” on 29 July 1897 into one centre (1,006 hPa) in the north of the High Tatra Mts. At the same time, the pressure gradient above the Czech territory increased with the north-western to northern flowing and an extreme retrograde displacement occurred of the cyclone centre towards the west to south-west.

18.3 Floods and Their Impacts

One of characteristic features of the flood at the end of July 1897 was its large area impact. Flood waves on watercourses were recorded nearly in the whole today’s territory of the Czech Republic but they reached the highest extreme in the Upper Labe (Elbe) Basin where the floods were unprecedented. Disasters on streams flowing from the Krkonoše Mts., namely on the Upper Labe (Elbe) River itself and on its left-bank tributary Úpa River, were compared to the Apocalypse. The extreme character of floods in this region corroborates also the extremity set up for culmination discharges delivered on the Labe R. at the Labská Station (beneath Špindlerův Mlýn) and on the Úpa R. at the Horní Maršov Station. According to Brázdil et al. (2005), the floods in these two localities belonged to events occurring on average once in a thousand years. Some hydrologists argue that the recurrence interval was not so extensive. In any case, however, there is a general agreement that the concerned floods were more than the hundred-year ones.

The disastrous flood showed in Bohemia also on the Lužická Nisa/Lusatian Neisse R., left bank tributary of the Odra R. and on the streams flowing down from the south-eastern slopes of the Krušné hory (Erzgebirge) Mts. The extreme floods were recorded also on their German side in Saxony, unprecedented on many water streams until the year 2002, which can be documented by historic floodmarks recorded since 1815 on the wall of a mill on the Freiburger Mulde R. in the town of Döbeln (Pohl 2004). It was as late as in August 2002 when the hitherto highest water course culmination from the beginning of August 1897 was pushed to the second place, being surmounted by 126 cm. The extraordinary character of floods on the left-bank tributaries of the Elbe R. in Saxony in summer 1897 is documented by numerous other floodmarks in the region. Although the Elbe River itself was in Germany affected by the high water, its water level increase was insignificant in the context of other flood cases.

Great floods occurred in 1897 also in the Odra River Basin. The flood on the Odra R. in Bohumín, i.e. on the then Prussian-Austrian border, was “only” a flood that occurs on average once in two to five years. However, the flood was gradually gaining strength further down the Odra R. course in the today’s Poland (the then Prussia). The reason were left-bank tributaries of the Odra River draining the mountain ranges of the Sudeten. Extreme floods were recorded for example in the watershed of the Nysa Kłodzka/Glatzer Neisse R. The largest inundations in the

Die
Hochwasser - Katastrophe
im
Riesengebirge
am
29. bis 30. Juli 1897.



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(H. F. Grabow).

Fig. 18.1 Front page of the occasional print "Flood disaster in the Krkonoše Mts. from 29–30 July 1897" (Jelenia Góra/Hirschberg 1897)

Odra River Basin in July 1897 occurred however on water streams flowing down from the Krkonoše Mts. and from the Jizerské hory Mts., particularly on the Bóbr/Bober River and on its left-bank affluent Kwisa/Queis R., and/or Nysa Lužycka/Lusatian Neisse R.

Historic publications issued shortly after the extreme flood disaster describe its course and tremendous losses in northern Bohemia, Saxony and Silesia. The main indicator of destruction is typically the number of casualties. The analysis of historic and later assessments of this flood event speak of 120 life victims on the Czech side of the Krkonoše Mts. (of these 17 in a small village of Dolní Maršov on the Úpa River). Life victims documented so far on the Czech side of the Krušné hory (Erzgebirge) Mts. are 4 and 23 were recorded on the German side. As to Silesia, historic print published towards the end of 1897 in Jelenia Góra/Hirschberg *Die Hochwasser Katastrophe im Riesergebirge...* (Fig. 18.1) speak together of a minimum number of 20 human lives lost, but according to Fischer (1898) were 28 casualties.

The disastrous flood with great damages (illustrated here with examples Figs. 18.2, 18.3, 18.4, 18.5) became an important impetus for a range of flood-control measures in all affected countries and regions. Numerous acts of law and flood-control regulations were issued and a decision was made on hydraulic engineering works that would contribute to the regulation of extreme discharge and to the mitigation of flood damages in the future.



Fig. 18.2 Hotel Deutscher Kaiser in Špindlerův Mlýn (CZ) on 30 July 1897 (Photo F. Joffe – archives of P. Scheufler)



Fig. 18.3 Jedlica R. from the Bóbr/Bober R. basin and destroyed houses in Kowary (PL) after the flood in summer 1897 – according to Sawicki (2004)



Fig. 18.4 Jelenia Góra-Sobieszów (PL): Woody depositions on the bridge after the flood 1897 blocked stream channel in the Bóbr/Bober R. basin (<http://wroclaw.hydral.com.pl>)

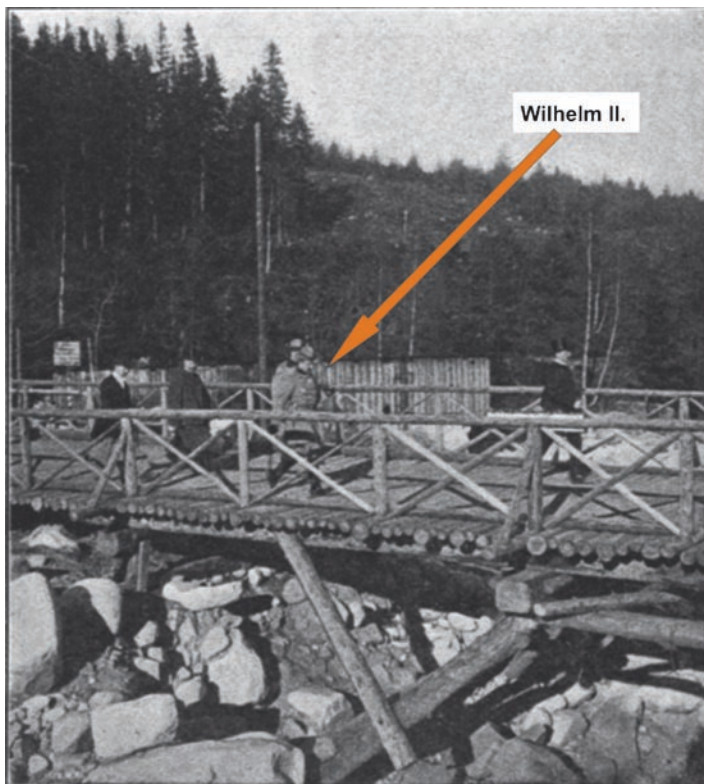


Fig. 18.5 The German Emperor Wilhelm II and his entourage on the new bridge in the village of Brzezinec (PL) in the Kwisa/Queis R. basin after the flood in 1897 (Source: Bunte Bilder aus dem Schlesierlande, Breslau 1903)

18.4 Conclusion

The floods of summer 1897 were a typical example of the hydrometeorological extreme reaching beyond the country borders and affecting a number of European countries (e.g. Munzar, Ondráček et al. 2007). Since the culmination of rivers and streams occurred at night, a minimum number of life victims in Central Europe was about 175 as found by us. Material losses on dwelling houses, industrial plants, bridges, roads, farmland and crops were immense, thousands of people lost their lodgings. However, a positive consequence of the disaster was in the changed perception of flood-control measures (e.g. Czerwiński 1998). This extreme flood event closed the nineteenth century which is today often referred to as a “century of great floods”.

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