

# Event Recap Report: Central European Floods

1 July 2009



## Introduction

A significant rain event that began on 19 June 2009 brought summer flooding across central areas of Europe, causing the largest flood event in the region since 2002. The Czech Republic, Austria and Poland were amongst the hardest-hit countries. Southern Germany, Hungary and Slovakia have also declared flood alerts. At the time of writing, the situation appears to be stabilizing; however, states of emergency are still present along certain rivers of the region. The following sections detail the effects of the flooding in the countries hardest hit by the event.

## Meteorological background

A low pressure system forming over the Mediterranean Sea west of Italy (20 – 21 June), moving to the east and drawing large amounts of warm water from the sea before becoming stationary, led to the widespread prolonged precipitation. A depression called “Quinton” was pushing the wet air masses from the Mediterranean Sea in the southeast to the northwest, reaching Austria and Central and Eastern Europe. The precipitation had two main centers, which caused the flooding: one over the Northern Alps in Austria and Southern Germany; and the second over the Czech Republic at the border with Poland. On 25 June the system began to vanish, although low pressure remained in the area until 29 June, causing ongoing showers and thunderstorms (*source: ECMWF, ZAMG*).

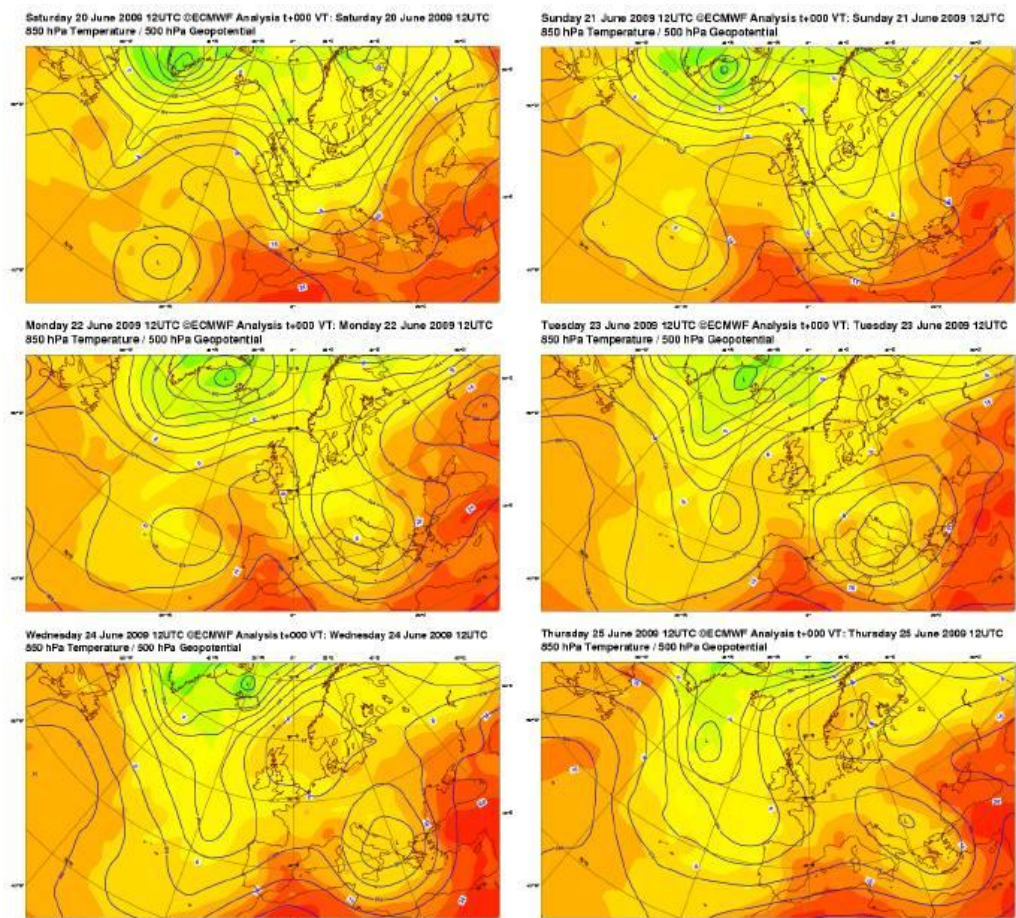


Figure – Weather situation during the period 20 – 25 June showing 500 hPa geopotential and 850 hPa temperature every 24 hours, illustrating the development of the low pressure system and its stationary nature that led to the prolonged rainfall (*source: ECMWF, ZAMG*)

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## Czech Republic

### Meteorological background

The first rounds of precipitation were brought by a cold front that arrived from the southeast on 19 June. The eastern sections of the Czech Republic – specifically Moravia and Silesia – received moderate amounts of rain, which did not cause a significant rise in river water levels. Over the course of the following few days, skies remained cloudy with occasional rain showers and thunderstorms (*source: Meteopress.cz*).

On 24 June, an area of low pressure in Italy and the Balkan Peninsula brought warm and moist air from the southeast. As the storm system hit the Beskydy Mountains in the eastern part of the Czech Republic, flash flooding began to occur as soils became oversaturated. During the height of the storms, rainfall rates over 40 millimeters (1.6 inches) per hour were recorded. In some areas, overnight storms delivered more than 100 millimeters (3.9 inches) of rain, which exceeded monthly rainfall totals. Furthermore, the storms remained over the same regions for an extended period of time. According to the Czech Hydro-Meteorological Institute (CHMI), the water level at the Rožnovská Bečva River in Valašské Meziříčí rose 120 centimeters (47 inches) in just a few hours, and the discharge increased by factor of 10 (*source: CHMI.cz*).

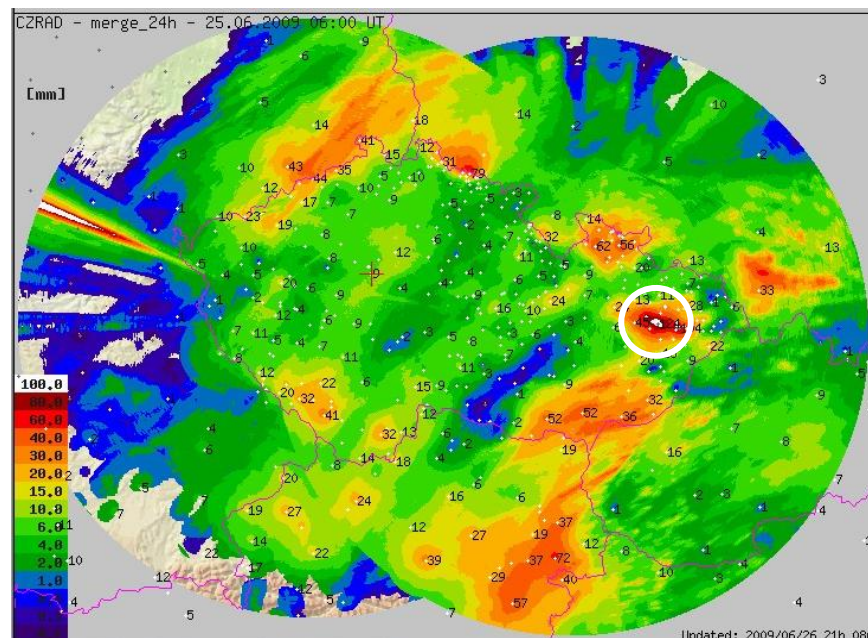


Figure – Radar and gauge precipitation estimates for 24 June, Novojičínsko region (circled in white) received over 100 millimeters (3.9 inches) of rain (*source: CHMI.cz*)

### Regions affected

The first regions affected by the heavy rains were in the northeast sections of the country. On 24 June, flooding was reported in the Nový Jičín and Vsetín districts, where hundreds of houses were flooded overnight. The first casualty of the event occurred in the village of Žilina. Later the flood waters attenuated, which meant that bigger cities located in lowlands, such as Ostrava, were unscathed.

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In the following days, additional storms hit various parts of the country. Windward sides of the mountains were adversely affected as streams on the northeast side of Jeseníky and the Šumava Mountains began to rise to flood levels. On 26 June, an evening storm in south Bohemia flooded a number of cellars. The rain continued over the weekend and river levels soared, prompting a local emergency declaration. Hundreds of people were evacuated from towns such as Bavorov and Vodňany. At the time of writing, most river levels had begun to ease. The highest local emergency designation, termed SPA III, was still being observed at a few gauge stations in south Bohemia (*source: CHMI.cz*).



Figure – The village of Strunkovice and Volynkou in the south Bohemia, June 28, 2009 (*source: REUTERS/Petr Josek (CZECH REPUBLIC ENVIRONMENT DISASTER) via alertnet.org*)

### Casualties

As of 29 June, there were 14 confirmed fatalities, of which 13 were reported in Moravia and one in southern Bohemia (*source: MF Dnes*).

### Property Damage

Total losses are estimated to top the 2006 losses of USD302million (CZK5.6 billion)

Moravskoslezský province: 23 municipalities, 900 houses (of which 450 houses are in the Novojičínsko province) seriously affected (*source: rozhlas.cz*)

Olomoucký province: 26 municipalities, over 300 flooded houses, estimated losses on infrastructure over USD27million (CZK500million)

Zlín province: 300 flooded houses, estimated losses on infrastructure USDmillions (tens of million CZK)

Jihočeský province: 17 municipalities, 300 flooded houses, estimated losses on infrastructure over USD5.4million (CZK100million)

(*source: Hospodářské noviny, MF Dnes*)

### Effect on Insurance Market and Insured Loss Estimates

Insured losses for the main insurance companies reported until 29 June are estimated to have reached USD43million (CZK800million) (*source: iHNED.cz, e15.cz*). However, this number will rise as further losses are being reported.

### Outlook

The CHMI issued a new flood warning on 29 June. Thunderstorms were expected during the day, especially in north Moravia and east Bohemia. Heavy rainfall and hail sometimes accompanied the storms. The precipitation was up to 40 millimeters (1.57 inches) per hour and water levels of smaller rivers have risen in some areas. Storms redeveloped on Tuesday and may continue periodically into Wednesday and Thursday. Rain has been forecast for Wednesday to Friday (1 – 3 July), so the SPA III warning designation in south Bohemia has been extended. With saturated soils, even small precipitation amounts could cause further flooding (*source: CHMI.cz*).

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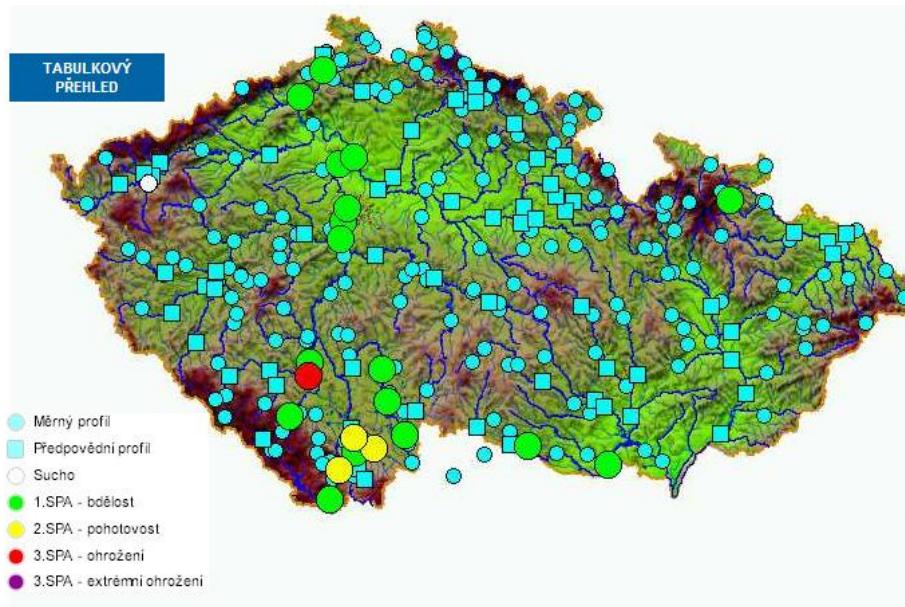


Figure – Emergency situation as at 1 July 2009 10.00 CET, red indicates SPA III, yellow SPA II and green SPA I (source: chmi.cz)

## Austria

### Meteorological background

For certain gauging stations, 50-year precipitation amounts were recorded, with the highest amount measured at Lunz in Lower Austria, with 252 millimeters (10 inches) in a 72 hour period, and 207 millimeters (8.2 inches) in a 48 hour period between 22 – 24 June. Large precipitation amounts were also observed in St. Poelten and Gmunden – 164 millimeters (6.5 inches) and 149 millimeters (5.9 inches) respectively in 48 hours (source: ZAMG.ac.at).

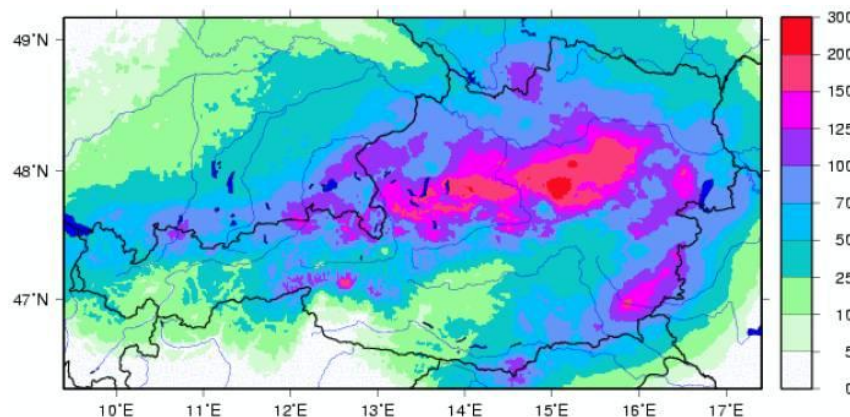


Figure – Accumulated 72 hour precipitation analyzed with INCA system for the period 22 – 25 June 2009 (source: ZAMG)

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The center of the intense rainfall was located in the southwest of Lower Austria and the south of Upper Austria. This led to overland flow as soils were saturated quickly, and the water concentrated in creeks and smaller rivers such as Trixnerbach and Leitha (Burgenland), accumulating in bigger tributaries of the Danube, including Ybbs, Traisen (passing St Poelten), Erlauf, Pielach and Enns, and leading to flows with a return period of up to 30 years (*source: Wasserstandsnachrichten Niederoesterreich*). From these tributaries, the Danube received considerable influx while the flow amounts were already high coming from the upper reach in southern Germany.

### Regions affected and effects on property

The most affected regions were Styria (the districts of Feldbach, Lienz and Leoben) and Burgenland. In several districts of Upper Austria the alarm was raised, and fire brigades were launched for 250 operations. Streets were flooded from channels, and small rivers burst their banks. In Feldbach, approximately 400 landslides and mudflows were recorded, forcing the evacuation of houses in the region. Landslides were also recorded in the districts of Fürstenfeld, Bruck, Hartberg, Graz-Umgebung, Leibnitz and Radkersburg. In the Leoben district, approximately 200 houses lost electricity. Economic losses are expected to reach tens of millions of USD (*source: Die Presse, orf.at*).

In the Neusiedl am See district in Burgenland, approximately 800 hectares (2,000 acres) of cropland were flooded. In the Güssing district, damage was reported to schools, cellars and houses. Sixty houses reported mainly flooded cellars in Strem. In the Güssing and Jennersdorf districts, landslides were reported. Lower Austria, Salzburg and Upper Austria also reported flood damage. In the city of Salzburg, flood damage was reported to many houses, cellars and under-crossings. In Upper Austria, at least 150 houses were affected and about 600 hectares (1,500 acres) of cropland were flooded.

Further heavy rainfall was observed in Styria on 29 June which led to high water levels and flooding on the river Enns, which affected Steyr – again one of the hardest hit areas during the flooding (*source: Nachrichten.at*).

### Casualties

On 28 June, a 16-year-old boy was found dead in the district of Amstetten in Lower Austria (*source: kleinezeitung.at*).

### Effects on the Insurance Market and Insured Loss Estimates

The insured losses for the entire country are estimated to be around USD140million (EUR100million) (*source: Kurier, 29th June 2009*). The losses are not expected to be of the same order of magnitude as the 2002 floods, where insured losses of USD590million (EUR420million) were published. The actual flood event is quite severe at certain locations, but not as widespread as the one in 2002 (*source: Nachrichten.at*).

### Outlook

More rainfall is forecast during the week. Rain is forecast for Wednesday to Friday (1 – 3 July). Any additional rainfall could potentially have serious implications, as the region's soils remain saturated from the previous rainfall.

## Poland

### Regions affected and effects on property

The first storms occurred late on 22 June into the early hours of 23 June in southern Poland. On 23 June, water levels in some rivers rose by three meters (nine feet) in less than one day. Heavy rains in Dolnośląskie, Opolskie and Małopolskie districts caused damage and interrupted power supplies. In Podlaskie district, almost 8,000 people lost electricity, while flooding in Myślenice (Małopolskie District) affected at least 60 houses. Heavy rains and strong thunderstorms also affected the Dolnośląskie, Śląskie, Małopolskie and Podkarpackie districts on the 24 June and 25

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June. In Ropczyce (Dolnośląskie), at least one person was killed by the flooding. On 26 June, additional heavy rains resulted in rising river levels in Dolnośląskie and Małopolskie districts. The worst flooding that day was recorded in the Kłodzko Basin, mainly in city of Kłodzko, where at least 41 bridges and 500 houses were destroyed, and more than 600 people were evacuated. The most affected regions included Jaskowa Dolna and Jaskowa Górna, Stronie and Żelazno located in the Kłodzko Basin. Losses (economic and insured) are expected to reach around USD253million (PLN800million) (*source: Dziennik Ubezpieczeniowy*). Losses for the Podkarpackie district are estimated to reach USD120million (PLN380million), with water destroying 320 kilometers of roads, 45 bridges, and 107 public utilities buildings (e.g. schools, libraries, etc).

## Effects on Insurance Market and Insured Loss Estimates

Detailed information will follow.

## Casualties

A casualty was reported on 25 June in Podkarpacie district, Brzeziny (ropczycko – sędziszowski powiat) (*source: sforapl.pl*)

## Outlook

The main part of the event across the region has ended, though a state of emergency was still in effect across the upper and lower Odra and Bug basins. However, rain is forecast for 1 and 2 July.

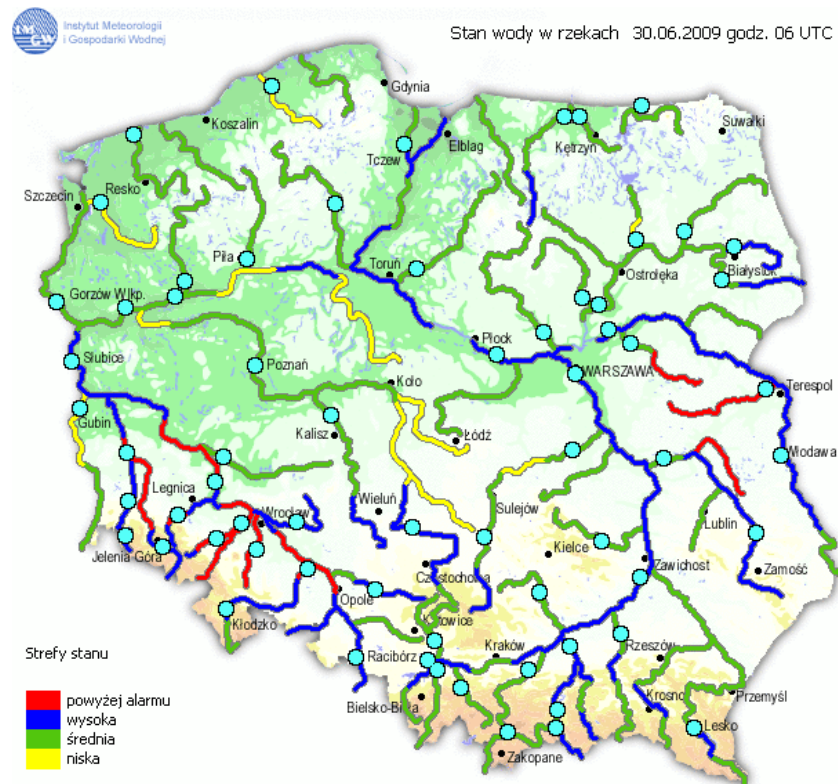


Figure – Emergency situation as at 30 June 2009 18.00 CET; red indicates flows over the alarm stage (equal to SPA III in the Czech Republic) (*source: imgw.pl*)

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