

Conference Agenda

Session

S10-04: Accounting for the Unpredictable: Climate Histories of Floods

Time: Friday, 22/Aug/2025: 9:00am - 10:30am

Location: 2-1024 Hybrid

Session Chair: **Andrea Kiss**, Vienna University of Technology

English Park Campus, House 2

Presentations

ID: 605

Panel

On-Site, Hybrid (both On-site and online)

Topics: Climate Histories

Keywords: flood reconstruction, coastal evolution, flood-society interaction, historical cartography, climate

Accounting for the unpredictable: climate histories of floods

Chair(s): **Andrea Kiss** (Vienna University of Technology, Austria); kiss@hydro.tuwien.ac.at

Presenter(s): **Rajmund Przybylak** (Nicolaus Copernicus University, Toruń, Poland), **Hrvoje Petrić** (University of Zagreb, Croatia), **Inês Amorim** (FLUP-CITCEM, Portugal), **Silvia Enzi** (Institute of Atmospheric Sciences and Climate (CNR-ISAC), Padova, Italy)

Panel abstract

In Europe, floods are the most frequent destructive climate hazards, and this was even more the case in the past. From the southwest through the Central Mediterranean to southern and northern East Central Europe, the panel provides a Europe-wide insight to the long-term flood behaviour, environmental impacts and social interpretations of river and sea floods in the last millennium.

While in the first presentation the frequency of reported destructive floods on a millennial scale in Poland and the northern part of East Central Europe is addressed, the second presenter discusses the unusual European floods of 1827 and some of their peculiar short- and long-term consequences.

Reflecting on long-term variabilities and changes in flood behaviour and historical-societal changes and transformation – in the second, southern European part of the session –, the third presentation is concentrated on the analysis of long-term environmental, hydromorphological evolution of shoreline in a Portuguese study area over the last three hundred years. Last but not least, our European flood journey takes us to the Eternal City, where the half-millennium interrelations between the river, floods and the society are analysed.

In the form of regional/country-wide case studies and European overviews, the four contributions cover large part of the continent, and delve into the complex subject placed at the intersection of natural sciences and humanities using quantitative methods as well as the qualitative approach.

Presentation 1

Babak Ghazi, Rajmund Przybylak, Piotr Oliński, Aleksandra Pospieszńska: 1000-year of flood occurrences in Poland

Knowledge about the frequency, intensity, and genesis of floods during historical periods in river basins worldwide is limited, mainly because the documentary evidence contains gaps in the coverage, quality and range of the necessary information. A comprehensive and reliable database is also time-consuming to create; therefore, there are few studies based on documentary evidence that analyze historical floods in various parts of the world for longer periods preceding the advent of instrumental measurements. Using a developed novel, reliable database of flood occurrences in Poland in the 11th–18th centuries and a list of floods for the 19th and 20th centuries based on a literature review, the frequency, intensity, genesis, and spatial distribution of floods in Poland in the last millennium were investigated. Analysis of results demonstrated the occurrence of 1,680 floods in Poland in the last millennium. The 18th century was the most abundant in recorded floods (356, 21%). Floods in the period 1001–1800 were most frequent in the Oder River basin (671, 55%), and in the Silesia region (553, 43%). Summer (JJA) was the most flood-prone season (46%), and therefore, rain was the main contributing factor to most of the flood occurrences in Poland (44%). According to the Mann-Kendall multi-temporal trend analyzing, overall, positive trends were more numerous for the periods of 1501–1700 and 1601–1800, whereas, more numerous negative for period 1801–2000.

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