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HYDRIC BATH — recent learnings and a new research methodology for the assessment of long-term flood risk using documentary evidence

Ioanna Stamataki[1], *Thomas R. Kjeldsen*[2]

Abstract

The HYDRIC BATH Project was a multidisciplinary project which aimed to investigate and assess the utility of documentary evidence of past flood events (1823-1960) for contemporary flood risk assessments. By bridging the fields of engineering, history and statistics and drawing from the combination of the use of historical documentary evidence and modern technological modelling techniques, it allowed an improved assessment of long-term flood risk of the City of Bath, United Kingdom.

Bath is a historical UNESCO world-heritage site and as it has always been located close to the river, communities in Bath have experienced the effects of flooding since early settlements in Roman times. The novelty of this research was the different methodology adopted for information and data gathering compared to current scientific practice. A 1D hydraulic model representing the River Avon through the city of Bath was constructed using data collected from a variety of sources and in various formats, including historical photographs, local knowledge, engineering drawings, technical reports, water level charts, and physical markings of historical water levels in the city. Identification and translation of this material into a unified and useful format was a major and challenging undertaking, at times relying purely on serendipity.

This project showed that the inclusion of historical flood data can have a dramatic effect on the outcome of a flood frequency analysis for contemporary flood risk assessments showing a 20-30% increase in the 100-year flood. The use of documentary sources is relevant to many disciplines, thus, central repositories of this information need to be created to facilitate this. This research was an important paving stone towards the integration of social science and digital / IT to aid scientific investigations in the field of engineering.

Keywords: flooding; historical flood; flood marks; documentary sources; hydrological reconstruction

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[1] *Corresponding Author*. Faculty of Engineering & Science, University of Greenwich, School of Engineering, Central Avenue, Chatham, ME4 4TB, United Kingdom; e-mail: i.stamataki@greenwich.ac.uk

[2] Department of Architecture & Civil Engineering, University of Bath, 6 East, Bath, BA2 7AY, United Kingdom; e-mail: t.r.kjeldsen@bath.ac.uk.

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