

To what extent have changes in river channel capacity contributed to flood hazard trends in England and Wales?

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Project outline

Freshwater flood damages have increased dramatically over recent decades, and are of concern to millions of people living in flood-prone areas across the world. Most studies assume that trends in flood hazard are driven by changes in streamflow. However, widespread anthropogenic influences on river systems have caused changes in the capacity of river channels, which can also modify flood hazard. The aim of this project was to investigate how geomorphic trends in channel capacity have contributed to changing flood hazards, in comparison with hydro-climatic trends in the frequency of flood flows, across England and Wales.

Project outcomes

The BSG research grant enabled me to visit the stream gauging sites at which I was quantifying geomorphic and hydrologic changes using historical hydrometric data provided by the Environment Agency and Natural Resources Wales. Through practical site visits with Environment Agency field officers to learn about stream gauging methods, interviews with residents, data collection, and site observation, the trips played a major role in helping me understand the nature and limitations of the stream gauging data and the causes of geomorphic change at each site. This understanding was central in writing an outreach piece for NERC's magazine *Planet Earth*. It also allowed me to put the data analyses into context in the resulting *Earth Surface Processes and Landforms* paper, with insight on future research directions regarding hydrometric data in the UK (Slater 2016). Additionally, the funding was instrumental in helping me disseminate the research at the AGU Fall Meeting in San Francisco, USA, and at the Ecole Normale Supérieure in Lyon, France. Through the connections that I made as part of these trips, the grant has acted as a springboard for my current research projects, which focus on the detection, attribution and forecasting of changes in flood hazard.



References

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- Slater, L. J., M. B. Singer, and J. W. Kirchner (2015). Hydrologic versus geomorphic drivers of trends in flood hazard, *Geophysical Research Letters*, 42, 370–376, <http://doi.org/10.1002/2014GL062482>