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Flood rich periods, flood poor periods and the need to look beyond instrumental records

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For many, the later 20th Century and early 21st Century has become synonymous with a growing experience of flood risk. Scientists, politicians and the media have ascribed this to changing climate and there are good hypothetical reasons for human-induced climate change to be impacting upon the magnitude and frequency of extreme weather events. In this paper, I will interrogate this claim more carefully, using the UK's instrumental records of river flow, most of which begin after 1960, but a smaller number of which extend back into the 19th Century. Those records that extent back to the 19th Century suggest that major flood events tend to cluster into periods that are relatively flood rich and relatively flood poor, most notably in larger drainage basins: i.e. there is a clear scale issue. The timing (inset, duration, termination) of these periods varies systematically by region although there is a marked flood poor period for much of the UK during the late 1960s, 1970s and 1980s. It follows that at least some of the current experience of flooding, including why it has taken so many policy-makers and flood victims by surprise, may reflect a transition from a flood poor to a flood rich period, exacerbated by possible climate change impacts. These results point to the need to rethink how we think through what drives flood risk. First, it points to the need to look at some of the fundamental oscillations in core atmospheric drivers, such as the North Atlantic Multidecadal Oscillation, in explaining what drives flood risk. Consideration of precipitation, as opposed to river flow, is more advanced in this respect, and those of us working in rivers need to engage much more thoughtfully with atmospheric scientists. Second, it points to the severe inadequacies in using records of only a few decades duration. Even where these are pooled across adjacent sub-catchments, there is likely to be a severe bias in the estimation of flood return periods when we look at instrumental records alone. The key conclusion becomes the value of bringing into wide use records of river flow acquired using other methodologies that can capture the pre-instrumental record.