

Thames flooding isn't rising, long-term records show

March 6 2012, By Tom Marshall



River Thames in flood.

Events of the last few decades give the impression that major floods are becoming more common, but looking at the UK's longest-running series of river-level measurements over 60 years or longer shows this isn't the case.

In fact, since river levels were first logged at Teddington lock to the west of London in 1883, average yearly maximum river levels have declined substantially.

The scientists think this is because there are two main mechanisms that cause the river to [flood](#) -intense rain, and [melting snow](#) sending a large pulse of water into the river system.

The frequency of flood-generating [rainfall](#) across the Thames basin

shows little change over the last 120 years but increasing temperatures have resulted in heavy snowfall becoming much less common.

This has combined with a great deal of river-engineering work, deepening and straightening the Thames to allow it to accommodate higher flows.



Oxford in the great Thames flood of March 1947.

"It's high river levels rather than high river flows that cause flooding," says lead author Terry Marsh of the Centre for Ecology & Hydrology (CEH). "There's been very extensive work on the Thames, especially since the 1947 flood, which has substantially increased the capacity of its channel, so that it can cope with much larger amounts of water. This has meant there has been no fluvial flooding [that is, flooding caused by the river overflowing its banks] in the Teddington reach since 1974, which is quite remarkable."

The 1947 episode he refers to produced the twentieth century's most extensive flooding, and its most costly in real terms. It was caused primarily by melting snow; frozen ground made the situation worse by preventing the water from soaking into the soil.

The records show that the frequency of river floods fluctuates over a long cycle. Looking over the past 30 or 40 years suggests [flood](#) risk is rising, but that's largely because we've been in a flood-rich part of the cycle. Using a longer historical perspective, there is little evidence of any compelling long-term trend.

Marsh says this long-term cycle of flood-rich and flood-poor periods is due largely to variability in the climate; among the reasons for this is the North Atlantic Oscillation (NAO), a large-scale climatic phenomenon that influences storm frequency in the UK. The 1960s and 1970s, when the NAO was in a negative phase, were relatively, dry but over the following decades, the index of NAO strength increased rapidly as we moved into an era of much wetter winters. Only in the last couple of years has the cycle finally turned again.

Marsh says the report's conclusions are likely to apply to managed rivers elsewhere in the UK, although the decline in snowmelt is so far much less pronounced in Scotland and the north of England.

None of this is a reason to become complacent about the risk of floods. This research only covers those caused by overflowing rivers, and not other kinds such as urban flash flooding and coastal flooding. And while there's limited evidence for an increase in the frequency of major river floods, those that do happen are likely to be more damaging because much of the building that's taken place over the last century has been in risky floodplain areas.

Marsh adds that river flow data are the foundations of water management, and this exercise shows the value of keeping accurate records of river flows and levels over long periods; CEH maintains the National River Flow Archive, which collects, validates and makes available information from all over the country to meet the needs of a wide community of users.

The research appears in *Hydrology Research*.

More information: The Thames flood series: a lack of trend in flood magnitude and a decline in maximum levels. Terry Marsh and Catherine Harvey, *Hydrology Research* Vol 43 No 3 pp 203-214, 2012.

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