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Stella Creasy MP
House of Commons
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Dear Dr Creasy

Thank you for your recent emails about the flooding that affected your constituency and those of neighbouring MPs. We have followed up with colleagues across the Met Office to answer your additional questions.

Heavy summer showers are characterised by short duration and rapid fluctuations of intensity across localised areas. Moreover, while showers are possible at any time of year, during the summer they become more likely and widespread due to the local effects of the hills and valleys, land and sea, and subtle variations in heat and moisture. The atmosphere is often finely balanced in summer so that when warm air ascends, it can keep rising until it cools and forms shower clouds. These shower clouds will often form into lines known as convergence lines.

It is not unusual therefore for the UK to see locally heavy showers during the summer. There is no meteorological driver that puts Walthamstow and nearby areas at a particularly high risk of experiencing such conditions. The recently published [State of the UK Climate 2020](#) report mentions five examples of heavy summer rainfall in the precipitation section, which occurred in various locations around the UK (Wales, Cumbria, eastern Scotland, western Scotland and East Anglia) during 2020. As you suggested in your emails, the impact of these events will be determined by more than just the amount of rain which falls. Different land surfaces will respond differently to the same rainfall, with urban areas particularly vulnerable to surface water flooding due to having more hard surfaces than rural areas.

Regarding trends in the frequency or intensity of hourly rainfall extremes, it is not yet possible to discern underlying changes in local extremes across the UK from natural variability. Natural variability appears to dominate current observed trends in hourly rainfall - including an apparent increase in the intensity of heavy summer rainfall over the last 30 years ([Kendon et al, 2018](#)). The UK Climate Projections suggest that heavy hourly rainfall like we recently saw in the London flooding events will increase in the future. Rainfall exceeding 30mm/h is projected to be almost two times more frequent in 2070s under a high emissions scenario (RCP8.5) compared to the 1990s.



As you may be aware, the Government recently published an update to the [Surface water management action plan](#), which reports on progress to improve understanding and strengthen actions to reduce surface water flood risk. We will of course also continue to work with Local Resilience Forums to help people stay safe during periods of severe weather. For example, both the Met Office and the Environment Agency have been part of meetings organised by the Mayor of London in response to the recent flooding, which have brought together a range of organisations with expertise and responsibilities related to surface water flooding. The Met Office has provided these meetings with information about both current and future flood risk.

We are also working hard to develop and improve our nowcasting capability, which is a technique used for very short-range forecasting that can provide a source of detailed guidance on the location, extent, and timing of imminent, often high impact weather events. This is particularly relevant to heavy summer convective showers as their precise location is difficult to predict at longer lead times. We are currently trialling ways of communicating enhanced information to responders, and will build on this work, together with other key stakeholders, with the aim of doing all we can to maximise awareness of these events at the greatest lead times possible.

I do hope this information is useful.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Penny Endersby'.

Professor Penny Endersby
Chief Executive