# Summary of rainfall depth-duration observations - Stratfield Mortimer, 20 July 2007

*This note has been prepared at the request of Stratfield Mortimer Parish Council*



Rainfall observations are made at Stratfield Mortimer climatological station, a privately-run meteorological observatory. The site is well-exposed and fully meets all standard exposure criteria: it is an official Met Office and Environment Agency rainfall reporting site (station number 270162) and is located at NGR SU (41) 668 642, altitude 60 m above mean sea level. Records began at this site in June 1998 and have been made at another site in Mortimer since April 1987. Unbroken records have been maintained throughout this period by the author.

Cumulative rainfall observations are from a standard Met Office MkII 'five-inch' copper raingauge which was read twice manually on 20 July, at 0705 and 1945 GMT. A continuous rainfall record is obtained from two Didcot Instruments 0.2 mm tipping bucket raingauges which are logged every 5 minutes by a fully automatic computerised logging system. Records from the latter gauges have been adjusted to agree with the totals from the checkgauge following standard practice.

**Summary**
**On 19/20 July 2007, 81.1 mm of rain fell in Mortimer in 15 hours,** between 2130 GMT on 19 July and 1230 GMT on 20 July. (All times quoted are GMT: BST = GMT +1 hour). During the most intense phase of the storm, 21.0 mm fell in 30 minutes, 30.2 mm in 60 minutes and 58.3 mm in 3 hours. For comparison, the average *monthly* rainfall for July is only 39 mm.

**Assessment of rarity – short-period rainfall**
Rainfall intensities were the highest observed at this site in 20 years records for all periods from 30 minutes to 24 hours. More intense short-period falls (durations below 30 minutes) occurred in May 1999 and August 2002. It is likely that the return periods of the 1 hour to 3 hour falls were in the region of 30 to 50 years.

Table 1 gives details of the highest short period (5 min to 6 h) rainfall totals observed on 20 July 2007.

**Assessment of rarity – daily rainfall**
By convention the daily rainfall is taken as that for the 24 hour period commencing 0900 GMT. By this convention the daily rainfall for 19 July was 25.8 mm and that for 20 July 55.3 mm (see Table 2). On this occasion the heavy rainfall event straddled two rainfall days to give the total 81.1 mm referred to above. (Using the civil day convention, the total 0000 to 0000 GMT on 20 July was 78.2 mm.)

A continuous daily rainfall record for the Mortimer area has been assembled from Met Office archive sources back to 1 January 1910. Within this near-100 year period of record the daily rainfall total of 55.3 mm on 20 July has been exceeded seven times (see Table 3), although only once before in July (in 1941).

On this basis we might assign the daily total of 55 mm a return period of around 10 years (eight observed events in 96 years records). However the fall on 20 July was split across two rainfall days and the combined two day total 19-20 July (81.1 mm) has been exceeded only once since 1910, viz. on 14-15 September 1968 when 91.0 mm was recorded. On this latter occasion the rainfall, although very heavy and persistent, was distributed over a period of 36-48 hours rather than the 15 hours on 19/20 July 2007. **It is therefore a reasonable inference that the rainfall of 81.1 mm recorded within a 24 hour period on 19/20 July 2007 represented the highest 24 hour total in this area within the last 100 years or more.**

**Table 1 – Short period rainfall depth–duration extremes – Stratfield Mortimer, Berkshire, 20 July 2007**

| *Period* | *Rainfall amount (mm)* | *Rainfall intensity mm/h* | *Time started* |
|---|---|---|---|
| 5 min | 5.7 mm | 69 | 1055 GMT |
| 15 min | 14.5 mm | 58 | 1050 |
| 30 min | 21.0 mm | 42 | 1035 |
| 60 min | 30.2 mm | 30 | 1005 |
| 2 h | 45.3 mm | 23 | 0920 |
| 3 h | 58.3 mm | 19 | 0825 |
| 4 h | 64.3 mm | 16 | 0730 |
| 6 h | 71.6 mm | 12 | 0610 |

**Table 2 – Hourly rainfall totals – Stratfield Mortimer, Berkshire, 20 July 2007**

| *Hour GMT commencing* | *Rainfall total (mm)* | *Rainfall day totals* |
|---|---|---|
| 19 July, 0900 to 2100 GMT | nil | *24 hours commencing 0900 GMT 19 July:* 25.8 mm |
| 2100 | 2.7 | |
| 2200 | 0.2 | |
| 2300 | nil | |
| 20 July 0000 | 0.2 | |
| 0100 | nil | |
| 0200 | 0.4 | |
| 0300 | 0.6 | |
| 0400 | 1.0 | |
| 0500 | 0.6 | |
| 0600 | 3.2 | |
| 0700 | 5.1 | |
| 0800 | 11.8 | |
| 0900 | 14.0 | *24 hours commencing 0900 GMT 20 July:* 55.3 mm |
| 1000 | 27.3 | |
| 1100 | 13.0 | |
| 1200 | 1.0 | |
| 1300 | nil | |

| | | |
|---|---|---|
| 1400 to 0900 GMT 21 July | nil | |

**Table 3 – Highest daily (0900 – 0900 GMT) rainfall totals – combined Heckfield and Mortimer daily records, from 1 January 1910**

| *Date* | *Rainfall* | *Notes* |
|---|---|---|
| 31 October 1915 | 56.9 mm | |
| 25 July 1941 | 55.6 mm | July highest daily fall on record |
| 15 September 1968 | 57.7 mm | |
| 10 June 1971 | 55.7 mm | |
| 6 August 1982 | 58.4 mm | All month highest daily fall on record |
| 9 August 1999 | 57.1 mm | |
| 29 October 2000 | 57.9 mm | |

***About the author***

*The author is a Met Office trained meteorologist and climatologist and undertook research into heavy falls of rain for some years whilst in the employ of the Met Office. Although now professionally employed outside meteorology, he was awarded the title of Fellow of the Royal Meteorological Society (FRMetS) in 2003 as a mark of professional competence in the field, and was elected to the Governing body of the Royal Meteorological Society in 2006. He has published almost 100 papers on meteorological subjects, many of them on extremes of weather in the British Isles, including the most detailed published account of the Boscastle Storm (Cloudburst upon Hendraburnick Down: 'The Boscastle storm' of 16 August 2004,* Weather**, 60**, *pp 219-227*).

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