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NRFA PEAK FLOW DATASET VERSION 14

Note on changes from version 13

VERSION: 1.1

STATUS: FINAL

DATE: AUGUST 2025

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DOCUMENT VERSION CONTROL

Version	Date	Author	Description
1.0	30 JULY 2025	STEPHEN TURNER, CATHERINE SEFTON, GAYATRI SUMAN, AMIT KUMAR, RICHARD SMITH, OLIVER SWAIN, RAFAEL BARBEDO, ADAM GRIFFIN, GIANNI VESUVIANO, HADUSH MERESA	First draft of note on changes from version 13.
1.1	20 AUGUST 2025	As above	Final draft of release note incorporating suggested changes following external testing by the four UK Measuring Authorities.

ABBREVIATIONS

AMAX	Annual Maximum
BFIHOST	Base Flow Index based on the Hydrology of Soil Types
DRAINDENS	Drainage Density
DfIR	Department for Infrastructure – Rivers Directorate
EA	Environment Agency
FARL	Flood Attenuation due to Reservoirs and Lakes
FEH	Flood Estimation Handbook
FFC	Flood Frequency Curve
FPEXT	Floodplain Extent
IQR	Interquartile Range
NRFA	National River Flow Archive
NRW	Natural Resources Wales
POT	Peaks Over Threshold
QMED	Median Annual Maximum Flow
QMED_CD	Median Annual Maximum Flow estimate from catchment descriptors
$SAAR_{(YYZZ)}$	Standard-period Average Annual Rainfall (during the years YY to ZZ)
SEPA	Scottish Environment Protection Agency
$URBEXT_{(YYYY)}$	Urban Extent (in the year YYYY)
WY	Water Year

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2 INTRODUCTION

Version 14 of the NRFA Peak Flows Dataset contains AMAX and POT data for 926 gauging stations, of which 616 are in England, 178 are in Scotland, 94 are in Wales, and 38 are in Northern Ireland. A total of 552 stations are recommended for use in pooling groups ('Suitable for Pooling'), 350 stations are 'Suitable for *QMED*' only, and 24 stations are 'Suitable for Neither'.

2.1 Content of Version 14

This version 14 release contains the following updates:

- Network changes
- An additional water year of data (updated to 30th September 2024) for all active peak flow stations in the UK
- Full Period of Record Review for a subset of stations in the dataset (81 stations across the UK)
- Modifications to existing time series
- Addition of new catchment descriptors (see section 7.1 for more information):
    - $SAAR_{9120}$
    - $FARL_{2015}$
    - $URBEXT_{2015}$
    - $BFIHOST_{19SCALED}$
    - *DRAINDENS*

The version 14 release note also includes:

- Impact of the data changes (see section 8 for more information)

3 NETWORK CHANGES

A number of changes have been made to the gauging stations for which peak flow data are held on the NRFA since the release of version 13. Key changes are noted in this section.

3.1 Removal of Gauging Stations

Five stations have been removed from the dataset, listed in Table 1. Daily flows are still held on the NRFA, where indicated, although peak flow data will no longer be available on the website.

Table 1: Stations removed from the dataset in version 14.

Station Number	Station Name	Measuring Authority	NRFA daily flow station	Suitability	Comment
28004	Tame at Lea Marston	EA-WM	NO	NEITHER	Closed in 1982. Scatter in historical gaugings causes high uncertainty in rating and peak flow data.
28005	Tame at Elford	EA-WM	YES	NEITHER	Closed in 1984. Uncertainty regarding historical floodplain flow and, therefore, peak flows.
54111	Avon at Rugby	EA-WM	NO	POOLING	Poor performance at high flows, owing to influences from road bridges, flood alleviation scheme and seasonal weed growth.
80003	White Laggan Burn at Loch Dee	SEPA-SW	YES	QMED	Poor station performance for flood estimation.
96004	Strathmore at Allnabad	SEPA-NW	YES	QMED	Low confidence in flood flow calibration. Potential for return to peak flow dataset in the future.

3.2 Addition of Gauging Stations

Ten stations have been added to the dataset in version 14, listed in Table 2.

Table 2: Stations added to the dataset in version 14.

Station Number	Station Name	Measuring Authority	Daily flow station	Suitability	Comment
3004	Cassley at Rosehall	SEPA-NW	YES	POOLING	Gaugings of all but the highest flows confirm the suitability of flood rating for Peak Flows.
6007	Ness at Ness-side	SEPA-NW	YES	POOLING	Gaugings of all but the highest flows confirm the suitability of flood rating for Peak Flows.
13012	South Esk at Gella Bridge	SEPA-NE	YES	POOLING	Flows contained and gaugings of all but the highest flows confirm the suitability of flood rating for Peak Flows.
18008	Leny at Anie	SEPA-SE	YES	POOLING	Most flows contained and gaugings of all but the highest flows confirm the suitability of flood rating for Peak Flows.
21026	Tima Water at Deephope	SEPA-SE	YES	POOLING	Improved confidence in modelled rating segments due to gaugings confirms suitability for Peak Flows.
21036	Whiteadder Water at Abbey St Bathans	SEPA-SE	YES	POOLING	Improved confidence in modelled rating segments due to gaugings confirms suitability for Peak Flows.
39041	Lambourn at Shaw Ultrasonic	EA-T	YES	QMED	Replacement station for 39019 – Lambourn at Shaw following its closure.
48013	Cober at Boscadjack	EA-DC	YES	QMED	Gaugings of all but the highest flows confirm the suitability of flood rating for inclusion in the Peak Flow dataset up to QMED.
54090	Tanllwyth at Tanllwyth Flume	UKCEH	YES	NEITHER	Quality-controlled AMAX is made available pending full review.
54097	Hore at Upper Hore flume	UKCEH	YES	NEITHER	Quality-controlled AMAX is made available pending full review.

3.3 Closure of Gauging Stations

Eight stations have been closed in version 14, listed in Table 3. Previously recorded flow data for these stations are still contained in the dataset and shown on the NRFA website, but there will be no further updates in future.

Table 3: Stations closed in version 14.

Station Number	Station Name	Measuring Authority	Daily flow station	Suitability	Comment
21029	Tweed at Glenbreck	SEPA-SE	NO	QMED	Station closed due to resource pressures on the operator.
39019	Lambourn at Shaw	EA-T	YES	POOLING	Station closed but replaced by 39041 – Shaw Ultrasonic, which has been added in version 14. In future versions, NRFA and EA will look into whether combining records is feasible.
39053	Mole at Horley	EA-KSL	YES	QMED	Station closed because the rating significantly overestimates flow when compared to gaugings post-2003, which has been removed. Pre-2003 data deemed good enough to remain in Peak Flows Dataset.
39055	Yeading Brook West at North Hillingdon	EA-HNL	YES	POOLING	Station closed because recent flow data became very unreliable.
43012	Wylye at Norton Bavant	EA-WX	YES	POOLING	Station mothballed, replaced with Heytesbury A36 (not yet on NRFA).
66004	Wheeler at Bodfari	NRW	YES	QMED	Station closed due to ongoing access issues.
73012	Kent at Victoria Bridge	EA-CL	NO	POOLING	Station closed and replaced by a new station further downstream, which is a level-only station.
76003	Eamont at Udford	EA-CL	YES	POOLING	Station closed due to the impacts of Storm Desmond.

3.4 Changes to FEH Indicative Suitabilities

Indicative suitabilities have changed at ten stations, five in Scotland, three in England, one in Northern Ireland and one in Wales, shown in Table 4. Six stations have been upgraded, whilst four stations have been downgraded.

Table 4: Stations with changes to indicative suitability in version 14.

Station Number	Station Name	Measuring Authority	V13 Suitability	V14 Suitability	Upgrade (↑) / Downgrade (↓) - Reason
21003	Tweed at Peebles	SEPA-SE	QMED	POOLING	↑ - Higher events calibrated from an in-depth fluvial modelling exercise.
21014	Tweed at Kingledores	SEPA-SE	QMED	POOLING	↑ - New floodplain flow estimation based on hydraulic modelling.
38022	Pymmes Brook at Edmonton Silver Street	EA-HNL	QMED	POOLING	↑ - Confidence in theoretical rating, no evidence to suggest drowning or bypassing.
39096	Wealdstone Brook at Wembley	EA-HNL	QMED	NEITHER	↓ - No gaugings in the peak flow range, and the theoretical rating cannot be validated.
66005	Clwyd at Ruthin Weir	NRW	POOLING	QMED	↓ - Significant upstream bypassing and likely influenced by the low bridge soffit.
76002	Eden at Warwick Bridge	EA-CL	POOLING	QMED	↓ - Uncertainty in floodplain flow, which is modelled but unmeasured.
83013	Irvine at Glenfield	SEPA-SW	NEITHER	POOLING	↑ - New flow estimation to the top of flood defence walls based on hydraulic modelling.
84011	Gryfe at Craigend	SEPA-SW	QMED	POOLING	↑ - Flows are mostly contained; historic ratings have been revised with the optimal flood segment applied.
95004	Abhainn a'Chnocain at Elphin	SEPA-NW	QMED	POOLING	↑ - High flows calibrated using a continuous velocity measurement installation.
203043	Oonawater at Shanmoy	DfIR	POOLING	QMED	↓ - Ungauged, out-of-bank flow at AMAX 4 and higher.

3.5 Component Stations

At several gauging stations, flows are derived from measurements taken at more than one location (for example, low flows may be measured at a weir and high flows measured at a gauged section a short distance up/downstream). There are several such stations around the UK that the NRFA and/or Measuring Authority treat as a combined station.

No changes have been made to the composition of these gauging stations since version 4.1, although new component stations may have been added to the dataset since version 4.1.

3.6 Gauging Stations Where No POT Data are Presented

No POT data are presented on the NRFA website or given in the dataset for stations listed in ANNEX 1.

Stations are usually listed as 'POT excluded' because the gauged catchment response does not lend itself to POT analysis. Such catchments are usually, but not exclusively, those dominated by baseflow and are therefore concentrated on the large chalk aquifers of southern and eastern England.

Thirteen stations were added to the list in version 14, shown in Table 5 and marked with a * in ANNEX 1. Nine of these are at the Plynlimon sites operated by UKCEH, with POT data removed as an interim measure to make quality-controlled AMAX flows available pending a full review.

Table 5: Stations which have been made POT Excluded in version 14.

Station Number	Station Name	Measuring Authority
28027	Erewash at Sandiacre	EA-EM
33051	Cam at Chesterford	EA-EA
39049	Silk Stream at Colindeep Lane	EA-HNL
54022	Severn at Plynlimon Flume	UKCEH
54090	Tanllwyth at Tanllwyth flume	UKCEH
54091	Severn at Hafren flume	UKCEH
54092	Hore at Hore flume	UKCEH
54097	Hore at Upper Hore flume	UKCEH
55008	Wye at Cefn Brwyn	UKCEH
55033	Wye at Gwy Flume	UKCEH
55034	Cyff at Cyff Flume	UKCEH
55035	Iago at Iago Flume	UKCEH
73003	Kent at Burneside	EA-CL

3.7 Trends in AMAX Timeseries

Identification and interpretation of trends in observed time series are a necessary foundation for the development of appropriate water policy and management responses to climate-driven change.

The trend analysis has been undertaken on the version 14 data following the Hannaford et al, 2021 methodology. There is more information about the trend analysis methodology on the NRFA Website.

Practitioners should **not** change their process because of this alone, but instead should consult any guidance issued by the Measuring Authority for the region they are working in:

- England – Environment Agency: Guidance on non-stationary analysis and the use of trend information is provided in the Flood Estimation Guidelines available on: https://www.gov.uk/government/publications/flood-estimation-guidelines
- Wales – Natural Resources Wales: Guidance on non-stationary analysis and the use of trend information is provided in the NRW Flood Estimation Technical Guidance Note GN008, available from enquiries@naturalresourceswales.gov.uk
- Scotland – Scottish Environment Protection Agency
- Northern Ireland – Department for Infrastructure – Rivers

Mann-Kendall scores and significance of trends are presented in the WINFAP files as an **indication** of whether a trend is present (or not) in the AMAX timeseries and are calculated on the full period-of-record available for each gauging station, excluding rejected years and/or unrepresentative periods. Stations are eligible for trend analysis where at least 27 valid AMAX values were available and 10% or less of AMAX values were missing during that period.

Table 6 shows a comparison of the number of stations eligible for trend analysis and the change in significant positive and negative trends (5% level) between this version and the previous one, and Figure 1 shows the results of the trend analysis.

Table 6: Comparison of trend tests between version 13 and version 14.

Version	No. of Stations Included	% of stations with significant positive trends (5% level)	% of stations with significant negative trends (5% level)
13	723	21	3
14	734	23	3

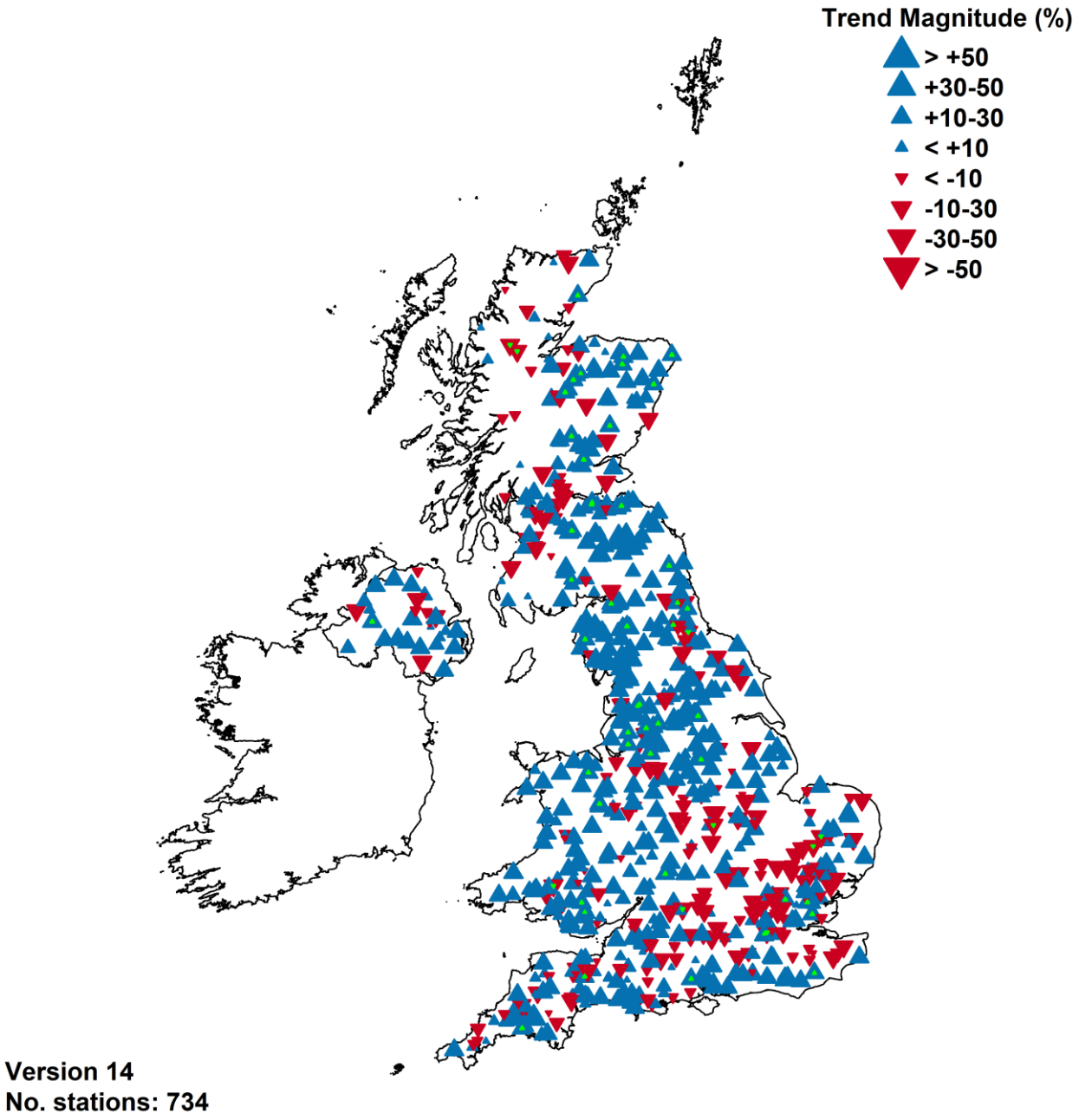

Figure 1 Trend analysis of AMAX for gauging station period of record, excluding rejected years and/or unrepresentative periods. Magnitude is shown according to the key as a percentage change. Green colouration of Triangles denotes a significant trend using the Mann-Kendall test (5%) level, accounting for serial correlation where present. Analysis based on NRFA Peak Flow Dataset version 14 using the standard NRFA trend testing approach (see Hannaford et al. 2021 for further details).

4 ANNUAL UPDATE

As part of the stewardship arrangements for the national Peak Flows Dataset by the UK Centre for Ecology & Hydrology through the National River Flow Archive, a programme of annual updates has been implemented. It is intended that all currently operating NRFA Peak Flow stations are updated each year with the addition of one water year of data.

4.1 Addition of water year 2023/2024

The version 14 files contain AMAX and POT time-series data updated to 30th September 2024 for all currently operational NRFA Peak Flow gauging stations in England, Scotland, Wales, and Northern Ireland.

4.2 New AMAX 1 records

New AMAX records (AMAX 1, the highest ranking in the period of record) were set at 51 stations in the water year 2023/2024, listed in Table 7 with the percentage change from the previous AMAX 1.

Table 7: New AMAX 1 records set in water year 2023/2024.

Station Number	Station Name	Measuring Authority	% increase	Date of new AMAX1	Record Length
2001	Helmsdale at Kilphedir	SEPA-NW	15	21/10/2023 19:30	48
7008	Nairn at Balnafoich	SEPA-NW	44	05/02/2024 14:00	30
8007	Spey at Invertruim	SEPA-NW	2	08/10/2023 10:15	70
12008	Feugh at Heugh Head	SEPA-NE	1	20/10/2023 00:45	38
14002	Dighty Water at Balmossie Mill	SEPA-NE	96	20/10/2023 10:45	15
26003	Foston Beck at Foston Mill	EA-Y	16	11/02/2024 11:15	64
26015	Driffield Canal at Wansford Bridge	EA-Y	3	11/02/2024 11:15	13
27025	Rother at Woodhouse Mill	EA-Y	15	21/10/2023 14:30	62
27026	Rother at Whittington	EA-Y	11	20/10/2023 18:00	63
27040	Doe Lea at Staveley	EA-Y	9	20/10/2023 19:45	52
27052	Whitting at Sheepbridge	EA-Y	11	20/10/2023 14:00	47
28019	Trent at Drakelow Park	EA-WM	6	04/01/2024 04:15	64
28026	Anker at Polesworth	EA-WM	1	03/01/2024 06:15	55
28027	Erewash at Sandiacre	EA-EM	19	21/10/2023 08:00	58
28032	Meden at Church Warsop	EA-EM	57	20/10/2023 22:00	59
28048	Amber at Wingfield Park	EA-EM	26	20/10/2023 16:30	52
28055	Ecclesbourne at Duffield	EA-EM	5	20/10/2023 13:30	52
28060	Dover Beck at Lowdham	EA-EM	13	20/10/2023 15:30	50
28067	Derwent at Church Wilne	EA-EM	1	21/10/2023 12:45	50
28085	Derwent at St Mary's Bridge	EA-EM	4	21/10/2023 07:15	88
28086	Sence at South Wigston	EA-EM	42	02/01/2024 23:15	37
30005	Witham at Saltersford Total	EA-LN	58	20/10/2023 21:15	50
30006	Slea at Leasingham Mill	EA-LN	22	07/01/2024 08:00	39
30013	Heighington Beck at Heighington	EA-LN	9	21/10/2023 22:45	47
31004	Welland at Tallington Total	EA-LN	<1	03/01/2024 20:45	55
31005	Welland at Tixover	EA-LN	6	03/01/2024 14:30	61

Station Number	Station Name	Measuring Authority	% increase	Date of new AMAX1	Record Length
33011	Little Ouse at County Bridge Euston	EA-EA	1	24/10/2023 09:30	63
33015	Ouzel at Willen	EA-EA	12	28/09/2024 22:15	63
33028	Flit at Shefford	EA-EA	24	23/09/2024 23:15	58
33029	Stringside at Whitebridge	EA-EA	9	03/01/2024 06:00	58
33030	Clipstone Brook at Clipstone	EA-EA	150	22/09/2024 23:15	17
33046	Thet at Redbridge	EA-EA	3	21/10/2023 22:45	55
33054	Babingley at Castle Rising	EA-EA	13	22/02/2024 22:00	47
35003	Alde at Farnham	EA-EA	12	21/10/2023 00:15	62
35004	Ore at Beversham	EA-EA	45	21/10/2023 00:15	58
35008	Gipping at Stowmarket	EA-EA	6	20/10/2023 23:00	58
35010	Gipping at Bramford	EA-EA	8	21/10/2023 14:45	53
36002	Glem at Glemsford	EA-EA	28	20/10/2023 19:15	62
36009	Brett at Cockfield	EA-EA	29	20/10/2023 19:30	55
39037	Kennet at Marlborough	EA-T	255	05/01/2024 13:30	51
39088	Chess at Rickmansworth	EA-HNL	3	28/04/2024 21:15	49
42003	Lymington at Brockenhurst	EA-SSD	<1	02/11/2023 10:45	28
44001	Frome at East Stoke Total	EA-WX	6	08/12/2023 21:45	31
44015	Hooke at Hooke	EA-WX	4	02/11/2023 01:30	31
53013	Marden at Stanley	EA-WX	12	23/09/2024 23:00	51
53025	Mells at Vallis	EA-WX	2	04/01/2024 22:45	44
68005	Weaver at Audlem	EA-GMMC	6	20/10/2023 21:15	54
76019	Roe Beck at Stockdalewath	EA-CL	34	23/05/2024 00:30	24
76022	Caldew at Cummersdale	EA-CL	4	23/05/2024 03:45	26
203025	Callan at Martin's Bridge	DfIR	1	31/10/2023 18:15	52
206001	Clanrye at Mountmill Bridge	DfIR	36	31/10/2023 10:30	48

5 PERIOD OF RECORD REVIEW

A programme of Period of Record Reviews is undertaken as part of the stewardship arrangements for the national Peak Flows Dataset by the UK Centre for Ecology & Hydrology through the National River Flow Archive. It is intended that a subset of the NRFA Peak Flow stations is subject to a Period of Record Review each year and released in the next scheduled release of files for use in WINFAP. There are often larger full network tasks undertaken too, for example, to look at a piece of metadata for the whole region.

The Period of Record Review is extensive and covers a full review of:

- Flow and stage data (including extension of recent and, where applicable, early records)
- Gaugings and ratings
- Missing data periods
- FEH Suitability
- Metadata (station descriptions, station type, datum history, POT threshold, bankfull stage)
- Unrepresentative data periods and rejected data.

This section lists the stations and periods included in the Period of Record Review published in version 14. Major changes to the use of the data – POT thresholds, unrepresentative periods and rejected data – are detailed in section 6.

5.1 Gauging Stations Included

The Period of Record Review covered 81 stations: 11 in Scotland, 47 in England, 9 in Wales and 14 in Northern Ireland, listed in Table 8. At 6 existing NRFA Peak Flow stations in Scotland, the period of record has been extended by 18 water years to end with water year 2023/2024.

The Period of Record Review process for version 14 also involved the following activities:

- In Wales, a review of bankfull and structurefull levels was undertaken, alongside an investigation into pre-digital rating holdings in the NRFA's physical archive – results were fed back to NRW.
- For England, a review of AMAX comments for all Peak Flow stations was also undertaken.

Table 8: Stations included in the Period of Record Review in version 14.

Station Number	Station Name	Measuring Authority	Start date	End date
12001	Dee at Woodend	SEPA-NE	1972/1973	2023/2024
17001	Carron at Headswood	SEPA-SE	1988/1989	2023/2024
21003	Tweed at Peebles	SEPA-SE	1947/1948	2023/2024
21014	Tweed at Kingledores	SEPA-SE	1987/1988	2023/2024
21029	Tweed at Glenbreck	SEPA-SE	2008/2009	2023/2024
28004	Tame at Lea Marston	EA-WM	1965/1966	1981/1982
28005	Tame at Elford	EA-WM	1965/1966	1983/1984
28023	Wye at Ashford	EA-EM	1965/1966	2023/2024
28027	Erewash at Sandiacre	EA-EM	1992/1993	2022/2023
28032	Meden at Church Warsop	EA-EM	1972/1973	2023/2024
28083	Trent at Darlaston	EA-WM	1984/1985	2023/2024
28086	Sence at South Wigston	EA-EM	1984/1985	2023/2024
33007	Nar at Marham	EA-EA	1968/1969	2023/2024
33021	Rhee at Burnt Mill	EA-EA	1962/1963	2023/2024
33051	Cam at Chesterford	EA-EA	1970/1971	2023/2024
33052	Swaffham Lode at Swaffham Bulbeck	EA-EA	1970/1971	2023/2024

Station Number	Station Name	Measuring Authority	Start date	End date
37018	Ingrebourne at Gaynes Park	EA-HNL	1970/1971	2023/2024
38020	Cobbins Brook at Sewardstone Road	EA-HNL	1981/1982	2023/2024
39002	Thames at Days Weir	EA-T	1991/1992	2017/2018
39008	Thames at Eynsham	EA-T	1989/1990	2019/2020
39016	Kennet at Theale	EA-T	1961/1962	2022/2023
39019	Lambourn at Shaw	EA-T	1962/1963	2019/2020
39049	Silk Stream at Colindeep Lane	EA-HNL	1974/1975	2023/2024
39053	Mole at Horley	EA-KSL	1961/1962	2002/2003
39055	Yeading Brook West at North Hillingdon	EA-HNL	1978/1979	1994/1995
39089	Gade at Bury Mill	EA-HNL	1974/1975	2023/2024
40003	Medway at Teston / East Farleigh	EA-KSL	1970/1971	2023/2024
40007	Medway at Chafford / Colliers Land Bridge	EA-KSL	1967/1968	2023/2024
41018	Kird at Tanyards	EA-SSD	1981/1982	2000/2001
43007	Stour at Throop	EA-WX	1986/1987	2023/2024
43010	Allen at Loverley Farm	EA-WX	1991/1992	2023/2024
44015	Hooke at Hooke	EA-WX	1991/1992	2023/2024
45008	Otter at Fenny Bridges	EA-DC	1973/1974	2023/2024
47009	Tiddy at Tideford	EA-DC	1969/1970	2023/2024
47025	Wolf at Germansweek	EA-DC	1991/1992	2023/2024
48003	Fal at Tregony	EA-DC	1978/1979	2023/2024
50008	Lew at Gribbleford Bridge	EA-DC	1987/1988	2023/2024
50011	Okement at Jacobstowe	EA-DC	1973/1974	2023/2024
52006	Yeo at Pen Mill	EA-WX	1963/1964	2023/2024
52017	Congresbury Yeo at Iwood	EA-WX	1972/1973	2023/2024
53004	Chew at Compton Dando	EA-WX	1979/1980	2023/2024
53013	Marden at Stanley	EA-WX	1969/1970	2023/2024
54022	Severn at Plynlimon flume	UKCEH	1972/1973	2010/2011
54091	Severn at Hafren Flume	UKCEH	1975/1976	2010/2011
54092	Hore at Hore Flume	UKCEH	1973/1974	2009/2010
54907	Arrow at Broom	EA-WM	1975/1976	1976/1977
55002	Wye at Belmont	EA-WM	1969/1970	2023/2024
55008	Wye at Cefn Brwyn	UKCEH	1972/1973	2010/2011
55033	Wye at Gwy flume	UKCEH	1972/1973	2010/2011
55034	Cyff at Cyff flume	UKCEH	1972/1973	2010/2011
55035	Iago at Iago flume	UKCEH	1972/1973	1998/1999
64006	Leri at Dolybont	NRW	1971/1972	2023/2024
66005	Clwyd at Ruthin Weir	NRW	1992/1993	2023/2024
72006	Lune at Kirkby Lonsdale	EA-CL	1976/1977	1977/1978
72016	Wyre at Scorton Weir	EA-CL	1978/1979	2015/2016
73003	Kent at Burneside	EA-CL	1981/1982	1999/2000
73012	Kent at Victoria Bridge	EA-CL	1992/1993	2018/2019
75002	Derwent at Camerton	EA-CL	1975/1976	2009/2010
76002	Eden at Warwick Bridge	EA-CL	1959/1960	1997/1998
76010	Petteril at Harraby Green	EA-CL	1976/1977	2013/2014
77001	Esk at Netherby	EA-CL	1966/1967	2003/2004
83005	Irvine at Shewalton	SEPA-SW	1978/1979	2023/2024

Station Number	Station Name	Measuring Authority	Start date	End date
83013	Irvine at Glenfield	SEPA-SW	1982/1983	2023/2024
84011	Gryfe at Craigend	SEPA-SW	1963/1964	2023/2024
84020	Glazert Water at Milton of Campsie	SEPA-SW	1968/1969	2023/2024
85001	Leven at Linnbrane	SEPA-SW	1962/1963	2023/2024
95004	Abhainn a'Chnocain at Elphin	SEPA-NW	2008/2009	2023/2024
201002	Fairywater at Dudgeon Bridge	DfIR	1971/1972	2023/2024
201009	Owenkillew at Crosh	DfIR	1979/1980	2023/2024
203011	Main at Dromona	DfIR	1969/1970	2023/2024
203012	Ballinderry at Ballinderry Bridge	DfIR	1969/1970	2023/2024
203017	Upper Bann at Dynes Bridge	DfIR	1970/1971	1990/1991
203018	Six-Mile Water at Antrim	DfIR	1969/1970	2023/2024
203019	Claudy at Glenone Bridge	DfIR	1970/1971	2023/2024
203020	Moyola at Moyola New Bridge	DfIR	1970/1971	2023/2024
203026	Glenavy at Glenavy	DfIR	1971/1972	2000/2001
203043	Oonawater at Shanmoy	DfIR	1986/1987	2023/2024
203049	Clady at Clady Bridge	DfIR	1981/1982	2023/2024
205005	Ravernet at Ravernet	DfIR	1971/1972	2023/2024
205034	Woodburn at Control	DfIR	1959/1960	1970/1971
205101	Blackstaff at Eason's	DfIR	1978/1979	2001/2002

6 MODIFICATIONS TO EXISTING TIME SERIES

6.1 POT Independence

For stations in England operated by the Environment Agency and in Wales operated by Natural Resources Wales, the rules for independence between POT events have been clarified such that the minimum discharge in the trough between the two peaks must be less than two-thirds of the discharge of **both peaks** (FEH guidelines states the first peak, but this requires subsequent manual re-processing to remove spurious peaks). Previous Environment Agency data updates by the NRFA and under the HiFlows-UK initiative may also have utilised the 'both peaks rule'.

These rules apply at all Environment Agency and Natural Resources Wales-operated stations to POT events for water years **2014/2015** onwards. Additionally, for the stations listed in the linked Workbook, due to changes to stage-discharge relationships or other re-processing, the new independence rules apply from the date shown to the end of the period of record. Users should therefore be aware that at these stations, the independence criteria used to generate the POT series updates **may** vary throughout the flow record.

No changes have been made to the independence extraction criteria for POT data in Scotland or Northern Ireland.

6.2 POT Thresholds

The POT Threshold has changed at nine stations, shown in Table 9. POT Thresholds are assessed and should be set to produce around 3-5 POTs per year. Where this number is lower or higher, the threshold is changed. The national position is that changes to the POT Thresholds are only implemented where it is possible to do so for the whole period of record. This means that thresholds are not changed where there are pre-digital data that cannot be reprocessed (most notably, to implement a threshold reduction) or reasonably rejected.

Table 9: Stations with changes to POT Thresholds in version 14.

Station Number	Station Name	Measuring Authority	V13 POT Threshold (m/s^3)	V14 POT Threshold (m/s^3)
17001	Carron at Headswood	SEPA-SE	48.987	49
21029	Tweed at Glenbreck	SEPA-SE	18.857	22
28032	Meden at Church Warsop	EA-EM	3.558	2.515
39053	Mole at Horley	EA-KSL	15.622	20.5
48013	Cober at Boscadjack	EA-DC	3.678	3
83013	Irvine at Glenfield	SEPA-SW	53.206	58
84011	Gryfe at Craigend	SEPA-SW	48.532	48.5
84020	Glazert Water at Milton of Campsie	SEPA-SW	36.686	30
203019	Claudy at Glenone Bridge	DfIR	27.07	22.399

6.3 Minor Changes to AMAX and POT Records

Major changes to time series can be made through the Period of Record Review (see section 5) or through rating changes submitted as part of the Annual Update process (see section 6.4).

Other minor changes to individual events can be made outside of these processes. Six stations had edits to the historical time series in version 14, listed in Table 10.

Table 10: Stations with minor changes to time series in version 14.

Station Number	Station Name	Measuring Authority	Details of change
3002	Carron at Sgodachail	SEPA-NW	WY 2022/2023 removed due to uncertainties. Review pending.
28003	Tame at Water Orton	EA-WM	Correction to the discrepancy between EA and NRFA holdings in WY 1971/1972 and WY 1980/1981.
54102	Avon at Lilbourne	EA-WM	Correction to the discrepancy between EA and NRFA holdings in WY 2011/2012 and WY 2012/2013.
55029	Monnow at Grosmont	NRW	Re-addition of the lowest AMAX in WY 2010/2011 and WY 2017/2018, which were erroneously removed in version 13 and updated flow values reprocessed through correct rating in WY 1979/1980, WY 1982/1983 and WY 1983/1984.
60003	Taf at Clog-y-Fran	NRW	Correction to the discrepancy between NRW and NRFA holdings in WY 1988/1989.
72016	Wyre at Scorton Weir	EA-CL	Correction to WY 69/70 AMAX, where the flow wasn't previously calculated through the rating correctly.

6.4 Changes to Stage-Discharge Ratings and Reprocessed Data

Stage-discharge ratings have changed at ten stations as part of the routine Annual Update of the dataset. The period of reprocessed flow data is listed in Table 11, all stations have been reprocessed to the end of the record (water year 2023/2024). For stations included in the Period of Record Review (see Table 8), ratings have been reviewed and data re-processed as required.

Table 11: Stations with changes to stage-discharge ratings (in addition to those that have been changed through the Period of Record Review) and re-processed data in version 14.

Station Number	Station Name	Measuring Authority	Start date of re-processed data
19021	South Esk at Cowbridge	SEPA-SE	05/12/2020
27026	Rother at Whittington	EA-NE	08/11/1979
27049	Rye at Ness	EA-NE	Full period of record
28019	Trent at Drakelow Park	EA-WM	26/01/2008
43028	Chitterne Brook at Codford	EA-WX	Full period of record
54005	Severn at Montford	EA-WM	19/11/2005
54008	Teme at Tenbury	EA-EM	15/05/2012
56001	Usk at Chainbridge	NRW	07/08/2007
66006	Elwy at Pont-y-Gwyddel	NRW	30/12/2006
74007	Esk at Cropple How	EA-CL	Full period of record

6.5 Unrepresentative Data Periods

Some periods of data are unsuitable for use in WINFAP because they are unrepresentative of the hydrological behaviour of the catchment. These are shown on the NRFA website by pink shading on the AMAX and POT graphs (e.g. https://nrfa.ceh.ac.uk/data/station/peakflow/48011). The unrepresentative periods occur in two main situations:

1. Where there is a clear change in the catchment during the period of record. The most common example is where a large reservoir has been built, which therefore caused a change in the FARL (Flood Attenuation by Reservoirs and Lakes) value.
2. Where data quality has changed significantly during the period of record. The indicative suitability has been based on the better data, provided the length of the record is reasonable. In these cases, the years of poorer quality have been rejected.

New unrepresentative periods have been added at eight stations (Table 12) and edited at three stations (Table 13). The end dates for ongoing unrepresentative periods at a further 14 were extended to the end of water year 2023/2024.

Table 12: Unrepresentative periods added in version 14.

Station Number	Station Name	Measuring Authority	Start Date	End Date	Comments
21007	Ettrick Water at Lindean	SEPA-SE	29-OCT-2021 09:00:00	01-OCT-2024 08:45:00	Recent low to mid-level gaugings indicate a shift in the stage-flow relationship that is currently under investigation. Hence, the data are excluded until there is sufficient information to recalibrate.
28086	Sence at South Wigston	EA-EM	01-OCT-1983 09:00:00	01-OCT-1986 08:45:00	Early peak flow data are of poor quality.
39055	Yeading Brook West at North Hillingdon	EA-HNL	01-JAN-1979 09:00:00	01-MAR-1986 08:45:00	Daily mean flows are historically inconsistent, causing high uncertainty in the peak flow record.
47006	Lyd at Lifton Park	EA-DC	01-OCT-1961 09:00:00	01-OCT-1988 08:45:00	Rejection of flows before the impoundment of Roadford Lake to enable post-reservoir data for use.
47008	Thrushel at Tinhay	EA-DC	01-OCT-1969 09:00:00	01-OCT-1988 08:45:00	Rejection of flows before the impoundment of Roadford Lake to enable post-reservoir data for use.
52006	Yeo at Pen Mill	EA-WX	30-DEC-1977 09:00:00	04-JAN-1979 08:45:00	Only two stages per day are available, which are back-calculated from the daily mean flow, so AMAX and POT data will be incorrect.
83005	Irvine at Shewalton	SEPA-SW	01-OCT-1971 09:00:00	01-OCT-1977 08:45:00	Uncertainty in early records requires digitisation to improve.
84011	Gryfe at Craigend	SEPA-SW	01-OCT-1996 09:00:00	01-OCT-1999 08:45:00	Reduced confidence in flood calibration between WY 1996/1997 and WY 1999/2000, during weir repair.

Table 13: Unrepresentative periods edited in version 14.

Station Number	Station Name	Measuring Authority	Start Date	End Date	Comments
21003	Tweed at Peebles	SEPA-SE	01-OCT-1938 09:00:00	28-DEC-1940 08:45:00	Start date corrected to cover all of the data pre-December 1940.
55002	Wye at Belmont	EA-WM	16-DEC-1908 09:00:00	18-APR-1985	End date extended from 1973 to 1985 after re-assessment of data suitability (QMED only pre-1985, QMED and Pooling post-1985).
83013	Irvine at Glenfield	SEPA-SW	29-AUG-1913 09:00:00	01-OCT-1982 08:45:00	Start date changed from 01/10/1913 to 29/08/1913. Gaps, bypassing and sluice/lade operation all need to be factored into the revision of peak flows.

6.6 Rejected Data

AMAX and POT data that are unsuitable for use in flood estimation are marked as rejected in the dataset and not included in flood estimation calculations. These are shown by red bars (for AMAX) and red background (for POTs) on the interactive plots, and red crosses on the static plots, on the NRFA website AMAX and POT graphs, respectively (e.g. https://nrfa.ceh.ac.uk/data/station/peakflow/19006). All data falling within unrepresentative periods (see section 6.5) are rejected.

In addition, where periods of missing data are likely to have included the true AMAX, any AMAX recorded during that water year is likely rejected, following an assessment of the timing and magnitude of the submitted event and the 'true' event. If there is little difference or a significant event, despite the 'true' AMAX being missed, the events can remain unrejected to aid flood estimation. Where the true AMAX is recorded, the event is not rejected.

AMAX rejections have been added at twelve stations (Table 14) and removed at six stations (Table 15).

Table 14: AMAX data now classed as rejected in version 14.

Station Number	Station Name	Measuring Authority	Rejected water years(s)
18008	Leny at Anie	SEPA-SE	1991
27049	Rye at Ness	EA-Y	1973
28027	Erewash at Sandiacre	EA-EM	1983
39049	Silk Stream at Colindeep Lane	EA-HNL	1973
48013	Cober at Boscadjack	EA-DC	1998
52017	Congresbury Yeo at Iwood	EA-WX	1980
53004	Chew at Compton Dando	EA-WX	1969
55008	Wye at Cefn Brwyn	UKCEH	2010
55033	Wye at Gwy flume	UKCEH	1989
73003	Kent at Burneside	EA-CL	1992
73012	Kent at Victoria Bridge	EA-CL	2010
203017	Upper Bann at Dynes Bridge	DfIR	1970

Table 15: AMAX data no longer classed as rejected in version 14.

Station Number	Station Name	Measuring Authority	Water year(s) reinstated
52006	Yeo at Pen Mill	EA-WX	1961
54092	Hore at Hore Flume	UKCEH	2003, 2004
73003	Kent at Burneside	EA-CL	1991
84020	Glazert Water at Milton of Campsie	SEPA-SW	2000
203019	Claudy at Glenone Bridge	DfIR	1970
203020	Moyola at Moyola New Bridge	DfIR	1970, 1977

6.7 Datum Changes

A short table is provided on the NRFA website, at the bottom of the station information page (e.g. https://nrfa.ceh.ac.uk/data/station/info/201002), for each station, which details the datum and control history over the period of record, with dates of applicability. The datum history has been updated at 32 stations listed in ANNEX 2.

7 FEH CATCHMENT DESCRIPTORS

7.1 New Catchment Descriptors

As part of the NRFA's ongoing stewardship of the national Peak Flow Dataset, there are occasionally new descriptors added to the dataset, which may be for use with existing or future methods. In version 14 of the Peak Flows Dataset, the following new descriptors have been provided (Vesuviano et al. 2025), which describe a more recent representation of catchments and are for use with the FEH 2025 Statistical Method (Vesuviano & Griffin 2025):

- $FARL_{2015}$ – An update to the previous version of Flood Attenuation due to Reservoirs and Lakes (*FARL*), now using 2015 Land Cover Map data.
- $SAAR_{9120}$ – An update to the previous version of Standard-period Average Annual Rainfall for 1961-1990 (*SAAR*). $SAAR_{9120}$ uses 1991-2020 Met Office HadUK-Grid 1.3.0.0 in Great Britain, Northern Ireland, and the Republic of Ireland within approximately 25 km of the border, with a small amount of infilling using CEH-GEAR in areas more than 25 km from the border that drain through Northern Ireland.
- $URBEXT_{2015}$ – An update to the previous versions of catchment urban extent ($URBEXT_{1990}$ and $URBEXT_{2000}$), now using 2015 UKCEH Land Cover Map data.
- $BFIHOST19_{SCALED}$ – A minor update to the Base Flow Index based on the Hydrology of Soil Types 2019 update ($BFIHOST_{19}$) that excludes water bodies as a HOST class from the calculation to reduce correlation with *FARL* and $FARL_{2015}$.
- *DRAINDENS* – a descriptor that gives information on the drainage density of the catchment. It is defined by dividing the length of rivers (km)[1] by the contributing catchment area (km²). Higher drainage density indicates a catchment with many closely spaced streams. This often occurs in areas with impermeable soils, high annual rainfall, and steep slopes. Low drainage density suggests a catchment with fewer, more widely spaced streams. This is common in areas with flat terrain, low annual rainfall and permeable soils. These values are approximations, intended primarily for comparing catchment characteristics rather than giving precise measures. The *DRAINDENS* descriptor is not used in any FEH methods.

[1] UKCEH digital river network of Great Britain (1:50,000) - EIDC

7.2 Changes to Existing Catchment Descriptors

Occasionally, there are changes made to FEH catchment descriptors at stations following the uncovering of errors in the existing descriptors or other updates. In version 14, catchment descriptors at five stations have been changed shown in Table 16.

Table 16: Changes to catchment descriptors at individual stations in version 14.

Station Number	Station Name	Measuring Authority	Reason
26015	Driffield Canal at Wansford Bridge	EA-Y	Correction to Longest Drainage Path (LDP), which was one order of magnitude out in previous versions.
27073	Brompton Beck at Snainton Ings	EA-Y	Correction to the snapping on the digital terrain model (IHDTM) to include both branches in the catchment.
39026	Cherwell at Banbury	EA-T	Correction to the snapping on the digital terrain model (IHDTM) to include the small tributary just upstream of the weir.
43014	East Avon at Upavon East	EA-WX	Correction to the mean drainage path length (DPLBAR) and slope (DPSBAR), which were not updated following the updates applied in version 13.
55008	Wye at Cefn Brwyn	UKCEH	Correction to the snapping on the digital terrain model (IHDTM) to remove a small tributary just downstream of the weir.

8 IMPACT OF DATA CHANGES

8.1 New Catchment Descriptors

In version 14, four new catchment descriptors which impact flood estimation have been provided. They describe a more recent representation of catchments and are described in section 7.1.

8.2 Impact on FEH methods

As part of the NRFA and FEH's quality control procedures, the new data submitted within each data release cycle are assessed in terms of impact they make on key flood estimation statistics – *QMED*, 30-year and 100-year return period flows, using single-site analysis, donor transfer and pooling group methods. Substantial changes to these statistics can occur due to:

- Extension or shortening of flow records
- Extremely high or low flows in one water year
- Rating changes causing reprocessed flows
- Introduction and removal of stations flagged as 'Suitable for Pooling' as well as record length changes leading to changes to pooling groups.

Any stations with a greater than 10% change, in either direction, of any of the key flood estimation statistics are listed below in sections 8.4 and 8.5. Mean changes in key statistics are accompanied by values of IQR, the difference between the 25th and 75th percentiles of the given statistic.

Additionally, *AREA*, $SAAR_{6190}$, $BFIHOST_{19}$, *FARL*, *FPEXT*, $URBEXT_{2000}$ were checked for changes between version 13 and version 14. With the exception of those stations shown in Table 16, no stations were found to have more than 5% change in any of these descriptors.

For comparison of the data alone, this report diverges from recommended practice and uses the FEH 2025 Statistical Method on both version 13 and version 14. This allows the impacts of changes to gauging station flow data to be evaluated independently of the methodological updates. The FEH team recommends using the old (pre-2025) method when using version 13 for historical analysis.

8.3 Changes in Record Length and Pooling Group Size

Due to changes in record length and the introduction and removal of stations flagged as 'Suitable for Pooling', the average number of stations in pooling groups (using FEH 2025 Statistical Method for version 13 and version 14) has changed from 17.3 to 16.9 (mean difference -0.4). The median record length change is +1 year (range of -20 to +19) as shown in Figure 2 and Figure 3 and reasons for changes in record length at 31 sites are given in Table 17.

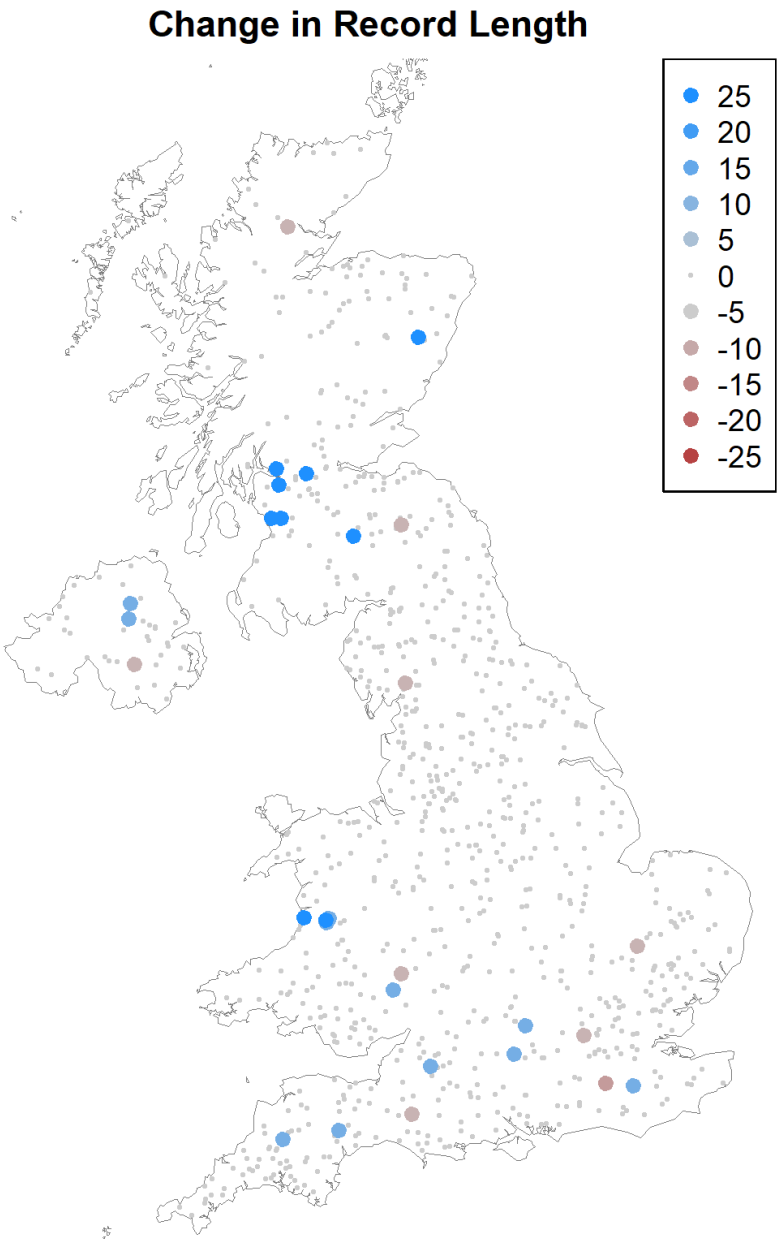

Figure 2 Changes in record length between the stations in both version 13 and version 14. Sites without an unusual change of record length are shown in small dots.

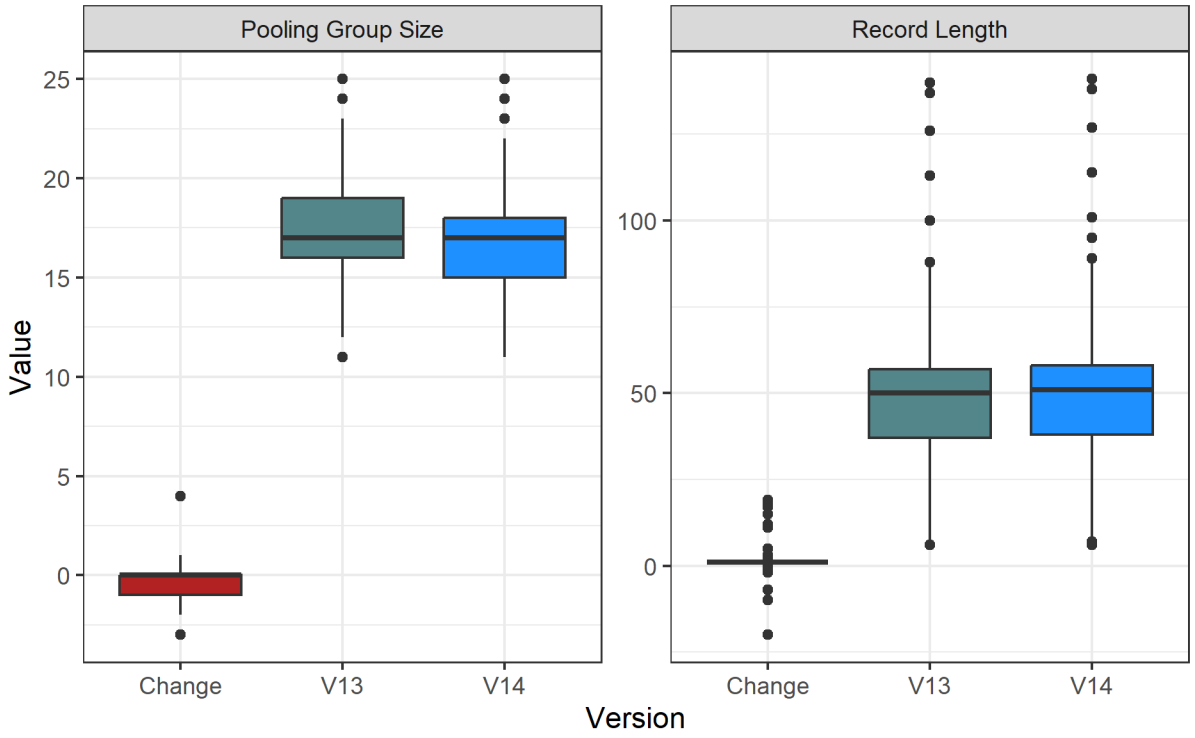

Figure 3 Changes in record length and Pooling Group size between version 13 and version 14. Boxes show inter-quartile range, the difference between the 25th and 75th percentiles of the given statistic.

Table 17: Reasons for changes in record length between version 13 and version 14.

Station Number	Station Name	Measuring Authority	Change (Years)	Reason
3002	Carron at Sgodachail	SEPA-NW	-1	Removed WY 22/23 due to deviation from gaugings, record frozen.
12001	Dee at Woodend	SEPA-NE	18	Record was previously frozen in 2006. Following rating review, now updated to present.
21007	Ettrick Water at Lindean	SEPA-SE	-2	Added unrepresentative period (see Table 12).
21029	Tweed at Glenbreck	SEPA-SE	15	Data from the reopened site has been added.
39002	Thames at Days Weir	EA-T	2	Site closed, data updated to closure date.
39019	Lambourn at Shaw	EA-T	2	Site closed, data updated to closure date.
39053	Mole at Horley	EA-KSL	-20	Data removed from 2003 onwards, and the site closed.
39055	Yeading Brook West at North Hillingdon	EA-HNL	-7	Added unrepresentative period (see Table 12).
40007	Medway at Chafford / Colliers Land Bridge	EA-KSL	2	Additional AMAX added in WY 1997/1998, that was previously missing, in addition to this year's annual update.
45001	Exe at Thorverton	EA-DC	2	WY 2022/2023 has been added in addition to this year's annual update.
47025	Wolf at Germansweek	EA-DC	2	WY 2022/2023 has been added in addition to this year's annual update.

Station Number	Station Name	Measuring Authority	Change (Years)	Reason
52006	Yeo at Pen Mill	EA-WX	-1	Added unrepresentative period (see Table 12).
53009	Wellow Brook at Wellow	EA-WX	2	WY 2022/2023 has been added in addition to this year's annual update.
54022	Severn at Plynlimon flume	UKCEH	2	Following Period of Record Review, new Plynlimon data added.
54092	Hore at Hore Flume	UKCEH	3	Following Period of Record Review, new Plynlimon data added.
55002	Wye at Belmont	EA-WM	-10	Extended unrepresentative period (see Table 13).
55008	Wye at Cefn Brwyn	UKCEH	2	Following Period of Record Review, new Plynlimon data added.
55029	Monnow at Grosmont	NRW	5	Added AMAX accidentally removed in a previous version.
55033	Wye at Gwy flume	UKCEH	3	Following Period of Record Review, new Plynlimon data added.
55034	Cyff at Cyff flume	UKCEH	3	Following Period of Record Review, new Plynlimon data added.
55035	Iago at Iago flume	UKCEH	11	Following Period of Record Review, new Plynlimon data added.
64006	Leri at Dolybont	NRW	12	Record previously frozen, following rating review, now updated to present.
73012	Kent at Victoria Bridge	EA-CL	-1	Historical station (no annual update), added rejected year (see Table 14)
83005	Irvine at Shewalton	SEPA-SW	17	Record was previously frozen in 2006. Following rating review, now updated to present.
83013	Irvine at Glenfield	SEPA-SW	17	Record was previously frozen in 2006. Following rating review, now updated to present.
84011	Gryfe at Craigend	SEPA-SW	15	Record was previously frozen in 2006. Following rating review, now updated to present.
84020	Glazert Water at Milton of Campsie	SEPA-SW	19	Record was previously frozen in 2006. Following rating review, now updated to present.
85001	Leven at Linnbrane	SEPA-SW	18	Record was previously frozen in 2006. Following rating review, now updated to present.
203017	Upper Bann at Dynes Bridge	DfIR	-1	Historical station (no annual update), added rejected year (see Table 14)
203019	Claudy at Glenone Bridge	DfIR	2	Removed previously rejected AMAX (see Table 15), in addition to this year's annual update.
203020	Moyola at Moyola New Bridge	DfIR	3	Removed previously rejected AMAX's (see Table 15), in addition to this year's annual update.

8.4 Impacts on Single-Site Flood Estimates

Differences between version 13 and version 14 have resulted in greater than 10% changes in one or more single-site flood estimation statistics at 52 stations, listed in Table 18 and mapped in Figure 4.

Table 18: Changes in gauged single-site *QMED*, 30- and 100-year return periods resulting from differences between version 13 and version 14. The asterisk indicates changes greater than 10%, positive or negative.

Station Number	Station Name	Measuring Authority	% change in:			Comment
			QMED	30-yr	100-yr	
7008	Nairn at Balnafoich	SEPA-NW	3	18*	27*	New AMAX1 in WY 2023/2024.
7011	Black Burn at Pluscarden Abbey	SEPA-NW	11*	3	0	Short record.
7012	Lossie at Ballachraggan	SEPA-NW	14*	7	2	New AMAX3 in WY 2023/2024.
9006	Deskford Burn at Cullen	SEPA-NW	12*	4	0	New AMAX3 in WY 2023/2024.
12001	Dee at Woodend	SEPA-NE	2	15*	22*	Addition of 18 more years of data, which includes a new AMAX1.
14002	Dighty Water at Balmossie Mill	SEPA-NE	14*	62*	94*	New AMAX1 in WY 2023/2024.
20003	Tyne at Spilmersford	SEPA-SE	11*	9	8	Median jumped between two clear regimes of flow.
21014	Tweed at Kingledores	SEPA-SE	0	39*	70*	Large increase in the highest AMAX due to rating change.
21029	Tweed at Glenbreck	SEPA-SE	3	22*	28*	Data from reopened station from the late 2000s to the present added.
21035	Till at Heaton Mill	EA-NE	12*	7	5	Short record. The last few AMAX have been in the middle of FFC.
27025	Rother at Woodhouse Mill	EA-Y	0	8	13*	New AMAX1 in WY 2023/2024.
27026	Rother at Whittington	EA-Y	1	9	14*	New AMAX1 in WY 2023/2024.
27040	Doe Lea at Staveley	EA-Y	2	10*	14*	New AMAX1 in WY 2023/2024.
27052	Whitting at Sheepbridge	EA-Y	1	10*	14*	New AMAX1 in WY 2023/2024.
28026	Anker at Polesworth	EA-WM	5	9	11*	New AMAX1 in WY 2023/2024.
28027	Erewash at Sandiacre	EA-EM	7	13*	17*	New AMAX1 in WY 2023/2024.
28032	Meden at Church Warsop	EA-EM	0	20*	32*	New AMAX1 in WY 2023/2024.
28048	Amber at Wingfield Park	EA-EM	0	11*	17*	New AMAX1 in WY 2023/2024.
28086	Sence at South Wigston	EA-EM	0	12*	18*	New AMAX1 in WY 2023/2024.
29009	Ancholme at Toft Newton	EA-LN	1	8	12*	New AMAX3 in WY 2023/2024.

Station Number	Station Name	Measuring Authority	% change in:			Comment
			QMED	30-yr	100-yr	
30005	Witham at Saltersford Total	EA-LN	1	15*	23*	New AMAX1 in WY 2023/2024.
30006	Slea at Leasingham Mill	EA-LN	5	13*	17*	New AMAX1 in WY 2023/2024.
30013	Heighington Beck at Heighington	EA-LN	1	24*	39*	New AMAX1 in WY 2023/2024.
33028	Flit at Shefford	EA-EA	3	20*	29*	New AMAX1 in WY 2023/2024.
33030	Clipstone Brook at Clipstone	EA-EA	2	71*	122*	New AMAX1 in WY 2023/2024.
33039	Bedford Ouse at Roxton	EA-EA	1	11*	16*	New AMAX2 in WY 2023/2024.
33054	Babingley at Castle Rising	EA-EA	0	15*	24*	New AMAX1 in WY 2023/2024.
35004	Ore at Beversham	EA-EA	2	13*	18*	New AMAX1 in WY 2023/2024.
35010	Gipping at Bramford	EA-EA	0	12*	17*	New AMAX1 in WY 2023/2024.
36002	Glem at Glemsford	EA-EA	0	11*	16*	New AMAX1 in WY 2023/2024.
36009	Brett at Cockfield	EA-EA	0	7	11*	New AMAX1 in WY 2023/2024.
38020	Cobbins Brook at Sewardstone Road	EA-HNL	1	10*	14*	The addition of two high-ranking AMAX in the 1980s. AMAX3 in WY 1981/1982, AMAX5 in WY1982/1983.
39008	Thames at Eynsham	EA-T	-2	23*	37*	Rating curve change increases the highest AMAX.
39037	Kennet at Marlborough	EA-T	3	56*	91*	New AMAX1 in WY 2023/2024.
39053	Mole at Horley	EA-KSL	-7	-10*	-10*	Removal of data post-2003 due to reliability concerns.
39088	Chess at Rickmansworth	EA-HNL	0	10*	15*	New AMAX1 in WY 2023/2024.
41018	Kird at Tanyards	EA-SSD	0	-7*	-11*	Reduction of 2000 value (AMAX1)
42003	Lymington at Brockenhurst	EA-SSD	10*	19*	23*	New AMAX1 in WY 2023/2024.
43028	Chitterne Brook at Codford	EA-WX	-16*	-37*	-43*	Rating curve change increases most AMAX.
43029	Wylye at Brixton Deverill	EA-WX	6	12*	15*	New AMAX2 in WY 2023/2024.
47025	Wolf at Germansweek	EA-DC	-24*	-40*	-45*	Rating curve change decreases most AMAX since 2010.
55008	Wye at Cefn Brwyn	UKCEH	16*	8	5	Increased AMAX due to rating curve change.
55035	Iago at Iago flume	UKCEH	0	13*	18*	Addition of 11 years of data, which includes a new AMAX1.
66006	Elwy at Pont-y-Gwyddel	NRW	1	7	11*	New AMAX3 in WY 2023/2024.
67009	Alyn at Rhydymwyn	NRW	0	7	11*	New AMAX2 in WY 2023/2024.

Station Number	Station Name	Measuring Authority	% change in:			Comment
			QMED	30-yr	100-yr	
68005	Weaver at Audlem	EA-GMMC	0	11*	17*	New AMAX1 in WY 2023/2024.
72016	Wyre at Scorton Weir	EA-CL	1	14*	22*	Closed station, but review added WY 2015/2016 AMAX2.
74007	Esk at Cropple How	EA-CL	3	15*	22*	Increased AMAX due to rating curve change.
76019	Roe Beck at Stockdalewath	EA-CL	1	17*	27*	New AMAX1 in WY 2023/2024.
83013	Irvine at Glenfield	SEPA-SW	2	-13*	-26*	Addition of 18 years of data.
84020	Glazert Water at Milton of Campsie	SEPA-SW	-15*	-20*	-21*	Addition of 18 years of data.
206001	Clanrye at Mountmill Bridge	DfIR	0	12*	19*	New AMAX1 in WY 2023/2024.

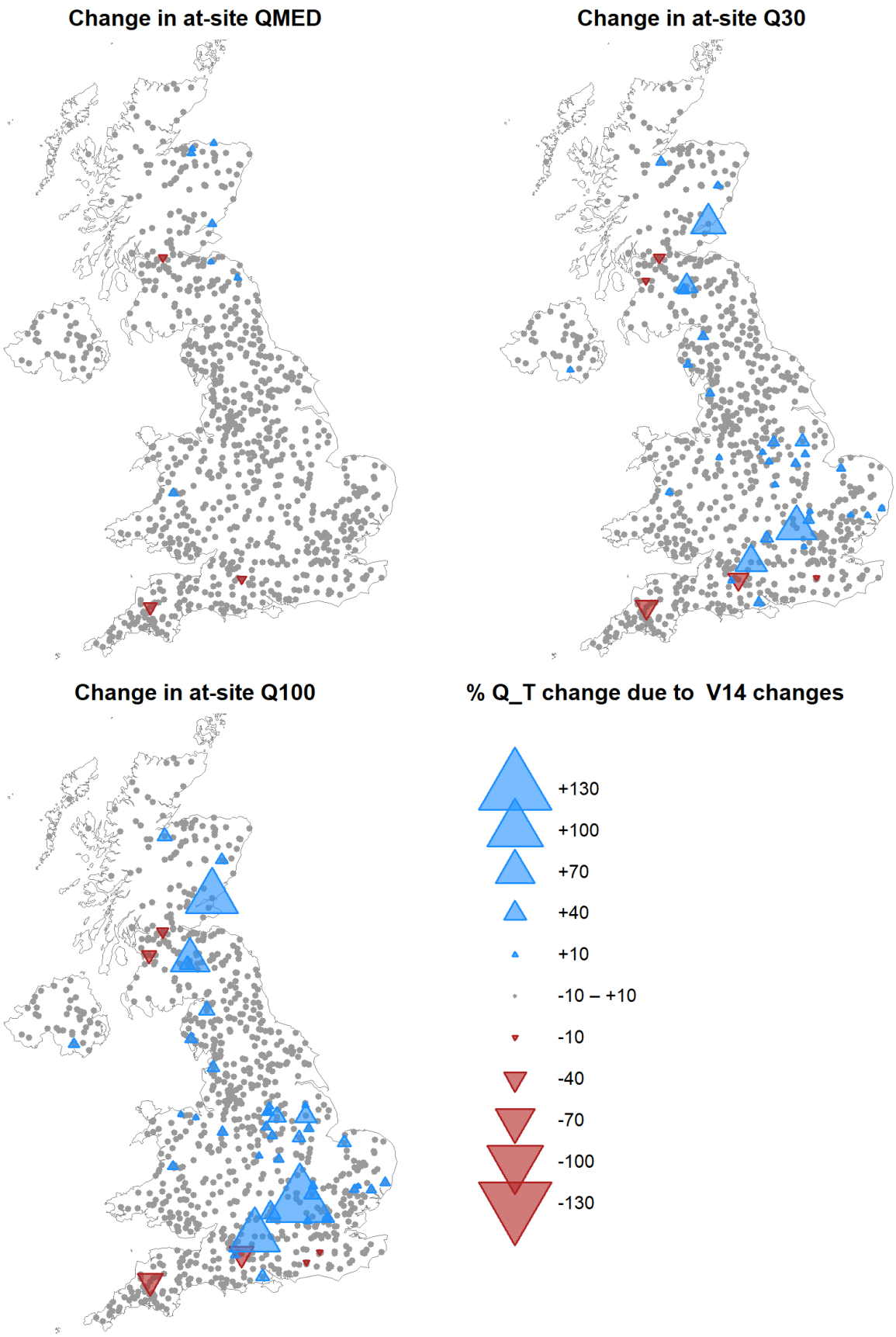

Figure 4 Changes in at-site *QMED*, 30-, and 100-year return period flows due to differences between version 13 and version 14.

8.5 Impacts on Donor Adjusted *QMED* Estimates

One station showed a change in donor-adjusted *QMED* of greater than 10%, due to the addition of data at the donor, listed in Table 19.

Table 19: Changes in donor-adjusted estimates of *QMED* resulting from differences between version 13 and version 14. The asterisk indicates changes greater than 10%, positive or negative.

Station Number	Station Name	Measuring Authority	% Change in Donor *QMED*	Comment
21031	Till at Etal	EA-NE	10*	Due to a large change in observed *QMED* at the closest station, 21035.

8.6 Impacts on Pooled Flood Estimates

Differences between version 13 and version 14 have resulted in greater than 10% changes in one or more pooled flood estimation statistics at 15 stations, listed in Table 20 and mapped in Figure 5.

Table 20: Changes in pooled estimates of 5-, 30- and 100-year return periods resulting from differences between version 13 and version 14. The asterisk indicates changes greater than 10%, positive or negative.

Station Number	Station Name	Measuring Authority	% change in:			Comment
			5-yr	30-yr	100-yr	
7011	Black Burn at Pluscarden Abbey	SEPA-NW	11*	10*	10*	Big change in *QMED*.
7012	Lossie at Ballachraggan	SEPA-NW	14*	13*	13*	New AMAX3 in WY 2023/2024.
9006	Deskford Burn at Cullen	SEPA-NW	12*	13*	14*	New AMAX3 in WY 2023/2024.
14002	Dighty Water at Balmossie Mill	SEPA-NE	16*	18*	20*	New AMAX1 in WY 2023/2024.
20003	Tyne at Spilmersford	SEPA-SE	11*	11*	12*	Big change in *QMED*.
21035	Till at Heaton Mill	EA-NE	12*	11*	10*	Big change in *QMED*.
27073	Brompton Beck at Snainton Ings	EA-Y	8	20*	27*	Large change in the pooling group due to catchment boundary edits, leading to a large change in FPEXT (-66%) and small change in AREA (6%)
28027	Erewash at Sandiacre	EA-EM	7	9	11*	New AMAX1 in WY 2023/2024.
30013	Heighington Beck at Heighington	EA-LN	3	7	10*	New AMAX1 in WY 2023/2024.
39037	Kennet at Marlborough	EA-T	6	10*	13*	New AMAX1 in WY 2023/2024.
42003	Lymington at Brockenhurst	EA-SSD	11*	12*	13*	New AMAX1 in WY 2023/2024.
43028	Chitterne Brook at Codford	EA-WX	-15*	-15*	-16*	Big change in *QMED*.
47025	Wolf at Germansweek	EA-DC	-25*	-27*	-28*	Change in the pooling group (95004 newly Pooling suitable) and big change in *QMED*.

Station Number	Station Name	Measuring Authority	% change in: 5-yr	30-yr	100-yr	Comment
55008	Wye at Cefn Brwyn	UKCEH	15*	13*	12*	Change in the pooling group, catchment boundary (8% change in FPEXT and -9% change in AREA) and *QMED*.
84020	Glazert Water at Milton of Campsie	SEPA-SW	-16*	-17*	-17*	Change in the pooling group, and the addition of 18 years of gauged record massively changed *QMED*.

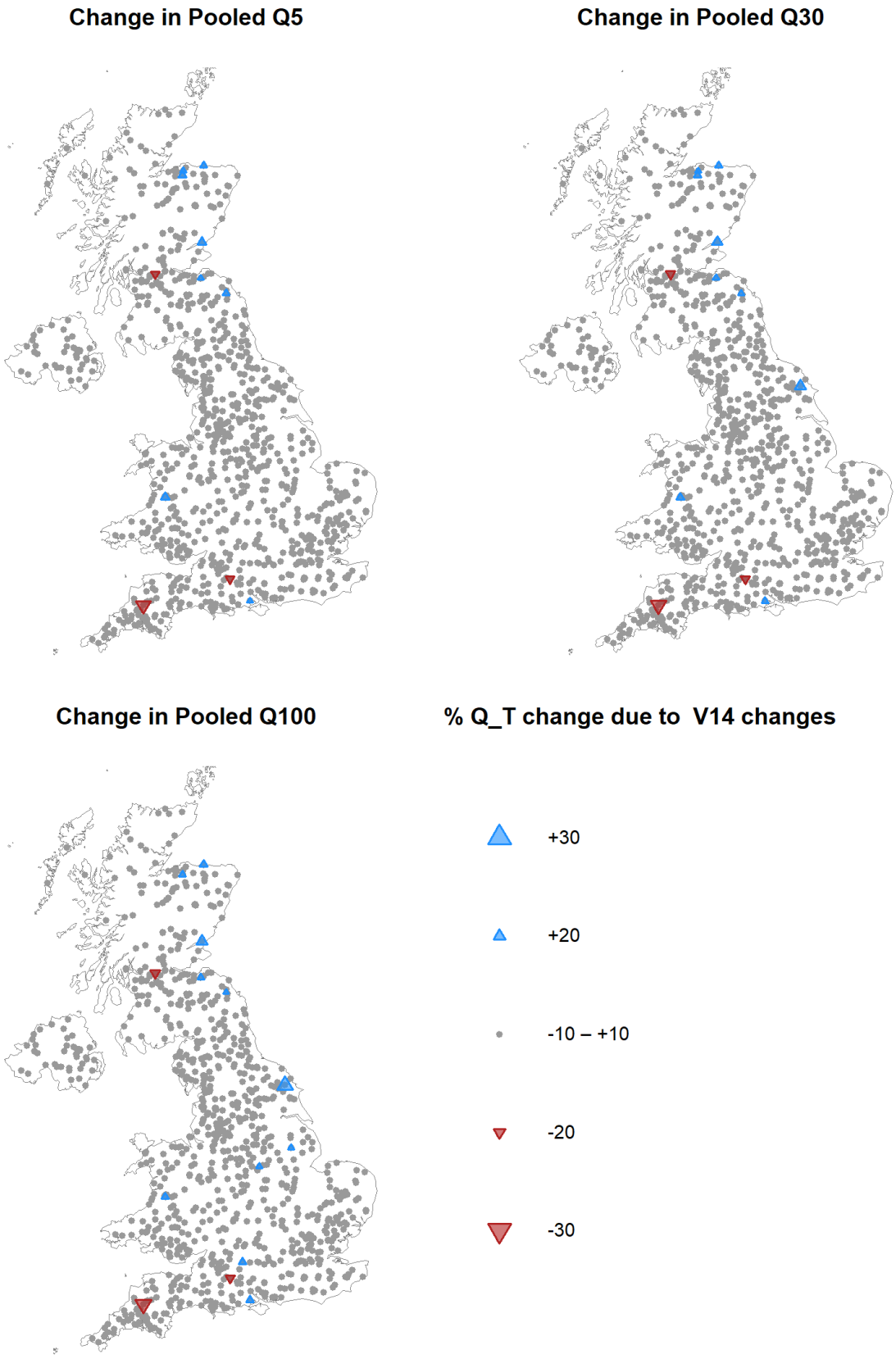

Figure 5 Changes in Pooled 5-, 30-, and 100-year return period flows due to differences between version 13 and version 14.

8.7 Impacts on Flood Estimates at Ungauged Locations

For a selection of 1,500 ungauged points on the GB gridded datasets (chosen to be representative of "All Catchments"), differences between version 13 and version 14 have been mapped in Figure 6, with changes of more than 5% highlighted. For this dataset, it should be noted that most of the catchments are very small (less than 25 km^2) and so all share quite similar pooling groups. The most common pooled stations experienced small changes in values this year, so the resultant pooled estimates exhibit very small changes. Note that this ungauged dataset is representative of the GB river network, not the NRFA station network, and so the big differences between Figure 5 and Figure 6 are not surprising, as few of the smallest catchments are gauged.

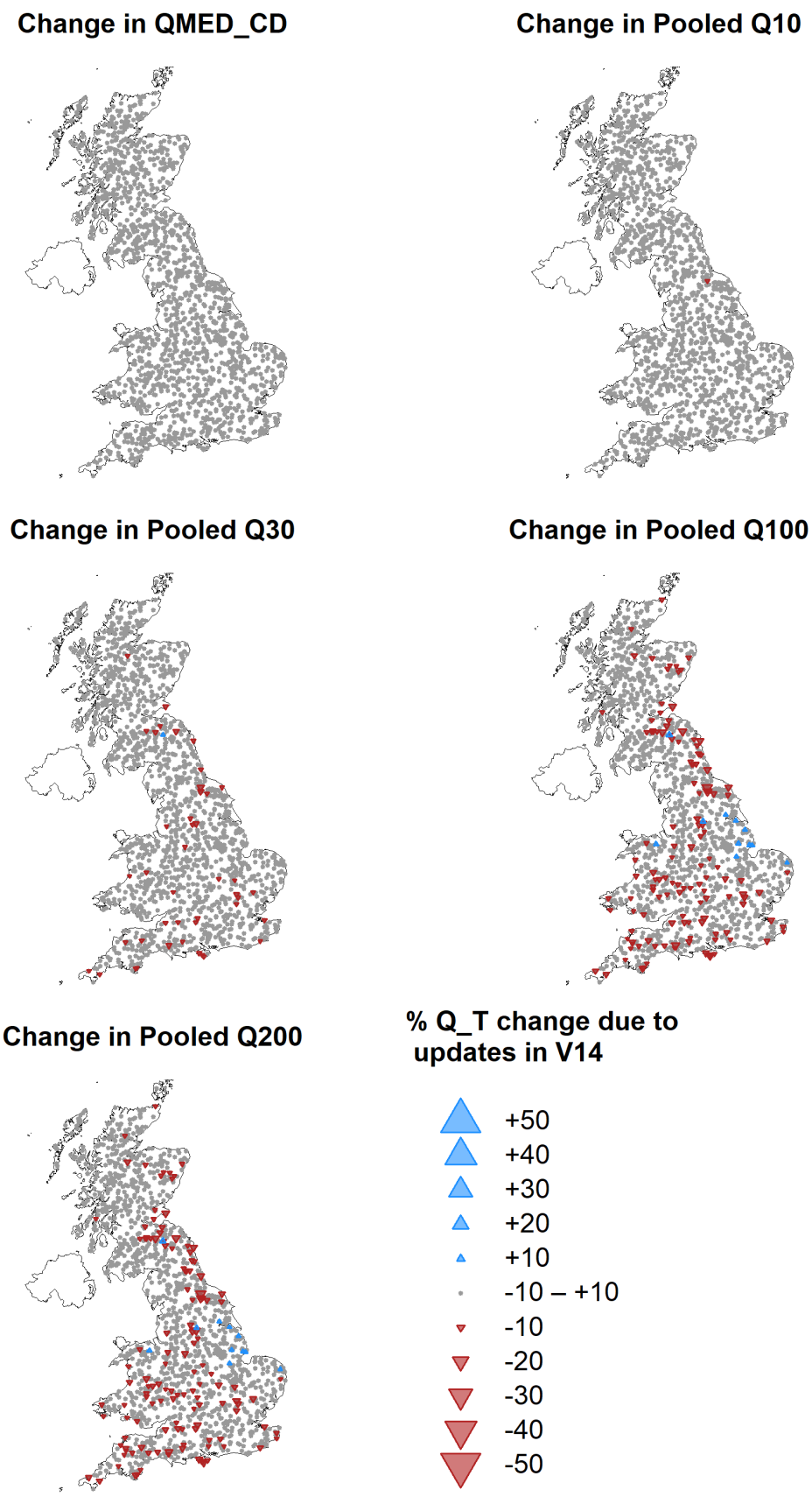

Figure 6 Changes in *QMED_CD*, Pooled 10-, 30-, 100- and 200-year return period flows due to differences between version 13 and version 14 at ungauged locations.

ANNEX 1 GAUGING STATIONS THAT HAVE POT DATA EXCLUDED

No POT data are presented on the NRFA website or given in the dataset for stations listed in ANNEX 1. 13 stations were added to the list in version 14, marked with a *. For more information see section 3.6.

Station Number	Station Name	Measuring Authority
23002	Derwent at Eddys Bridge	EA-NE
26003	Foston Beck at Foston Mill	EA-Y
26009	West Beck at Snakeholme Lock	EA-Y
26010	Driffield Canal at Snakeholme Lock	EA-Y
26013	Driffield Trout Stream at Driffield	EA-Y
26014	Water Forlornes at Driffield	EA-Y
26015	Driffield Canal at Wansford Bridge	EA-Y
26016	Gypsey Race at Kirby Grindalythe	EA-Y
26017	Ings Beck at South Newbald	EA-Y
27073	Brompton Beck at Snainton Ings	EA-Y
28027*	Erewash at Sandiacre	EA-EM
28033	Dove at Hollinsclough	EA-WM
28060	Dover Beck at Lowdham	EA-EM
30005	Witham at Saltersford Total	EA-LN
30006	Slea at Leasingham Mill	EA-LN
30013	Heighington Beck at Heighington	EA-LN
31004	Welland at Tallington Total	EA-LN
33005	Bedford Ouse at Thornborough Mill	EA-EA
33007	Nar at Marham	EA-EA
33012	Kym at Meagre Farm	EA-EA
33032	Heacham at Heacham	EA-EA
33049	Stanford Water at Buckenham Tofts	EA-EA
33050	Snail at Fordham	EA-EA
33051*	Cam at Chesterford	EA-EA
33052	Swaffham Lode at Swaffham Bulbeck	EA-EA
33054	Babingley at Castle Rising	EA-EA
34007	Dove at Oakley Park	EA-EA
34008	Ant at Honing Lock	EA-EA
34012	Burn at Burnham Overy	EA-EA
35003	Alde at Farnham	EA-EA
35004	Ore at Beversham	EA-EA
35010	Gipping at Bramford	EA-EA
36002	Glem at Glemsford	EA-EA
36003	Box at Polstead	EA-EA
36004	Chad Brook at Long Melford	EA-EA
36006	Stour at Langham	EA-EA
36007	Belchamp Brook at Bardfield Bridge	EA-EA
36008	Stour at Westmill	EA-EA
36009	Brett at Cockfield	EA-EA
36010	Bumpstead Brook at Broad Green	EA-EA
36011	Stour Brook at Sturmer	EA-EA
36012	Stour at Kedington	EA-EA
36015	Stour at Lamarsh	EA-EA

Station Number	Station Name	Measuring Authority
37003	Ter at Crabbs Bridge	EA-EA
37005	Colne at Lexden	EA-EA
37007	Wid at Writtle	EA-EA
37008	Chelmer at Springfield	EA-EA
37009	Brain at Guithavon Valley	EA-EA
37010	Blackwater at Appleford Bridge	EA-EA
37011	Chelmer at Churchend	EA-EA
37012	Colne at Poolstreet	EA-EA
37013	Sandon Brook at Sandon Bridge	EA-EA
37016	Pant at Copford Hall	EA-EA
37017	Blackwater at Stisted	EA-EA
37031	Crouch at Wickford	EA-EA
37033	Eastwood Brook at Eastwood	EA-EA
38011	Mimram at Fulling Mill	EA-HNL
39010	Colne at Denham	EA-HNL
39020	Coln at Bibury	EA-T
39021	Cherwell at Enslow Mill	EA-T
39027	Pang at Pangbourne	EA-T
39033	Winterbourne Stream at Bagnor	EA-T
39034	Evenlode at Cassington Mill	EA-T
39037	Kennet at Marlborough	EA-T
39041	Lambourn at Shaw Ultrasonic	EA-T
39049*	Silk Stream at Colindeep Lane	EA-HNL
39088	Chess at Rickmansworth	EA-HNL
39089	Gade at Bury Mill	EA-HNL
40033	Dour at Crabble Mill	EA-KSL
41015	Ems at Westbourne	EA-SSD
41023	Lavant at Graylingwell	EA-SSD
42005	Wallop Brook at Broughton	EA-SSD
42006	Meon at Mislingford	EA-SSD
42007	Alre at Drove Lane Alresford	EA-SSD
42008	Cheriton Stream at Sewards Bridge	EA-SSD
42009	Candover Stream at Borough Bridge	EA-SSD
42010	Itchen at Highbridge & Allbrook Total	EA-SSD
42012	Anton at Fullerton	EA-SSD
42017	Hermitage Stream at Havant	EA-SSD
43003	Avon at East Mills Total	EA-WX
43004	Bourne at Laverstock	EA-WX
43005	Avon at Amesbury	EA-WX
43008	Wylye at South Newton	EA-WX
43010	Allen at Loverley Farm	EA-WX
43012	Wylye at Norton Bavant	EA-WX
43018	Allen at Walford Mill	EA-WX
43028	Chitterne Brook at Codford	EA-WX
43029	Wylye at Brixton Deverill	EA-WX
44002	Piddle at Baggs Mill	EA-WX

Station Number	Station Name	Measuring Authority
44004	Frome at Dorchester Total	EA-WX
44006	Sydling Water at Sydling St Nicholas	EA-WX
44008	South Winterbourne at Winterbourne Steepleton	EA-WX
44009	Wey at Broadwey	EA-WX
44013	Piddle at Little Puddle	EA-WX
44014	Piddle at Briantspuddle	EA-WX
54022*	Severn at Plynlimon flume	UKCEH
54027	Frome at Ebley Mill	EA-WM
54090*	Tanllwyth at Tanllwyth Flume	UKCEH
54091*	Severn at Hafren Flume	UKCEH
54092*	Hore at Hore Flume	UKCEH
54097*	Hore at Upper Hore flume	UKCEH
55008*	Wye at Cefn Brwyn	UKCEH
55033*	Wye at Gwy flume	UKCEH
55034*	Cyff at Cyff flume	UKCEH
55035*	Iago at Iago flume	UKCEH
64010	Mawddach at Tyddyn Gwladys	NRW
68007	Wincham Brook at Lostock Gralam	EA-GMMC
68010	Fender at Ford Lane	EA-GMMC
69045	Bollin at Bollington Mill Total	EA-GMMC
71003	Croasdale Beck at Croasdale Flume	EA-CL
73003*	Kent at Burneside	EA-CL
84013	Clyde at Daldowie	SEPA-SW
85001	Leven at Linnbrane	SEPA-SW
205034	Woodburn at Control	DfIR
206006	Annalong at Recorder	BCDWC

ANNEX 2 GAUGING STATIONS WITH CHANGES TO DATUM HISTORY

The datum history has been updated at 32 stations listed in ANNEX 2. For more information see section 6.7.

Station Number	Station Name	Measuring Authority
3004	Cassley at Rosehall	SEPA-NW
6007	Ness at Ness-side	SEPA-NW
13012	South Esk at Gella Bridge	SEPA-NE
18008	Leny at Anie	SEPA-SE
21029	Tweed at Glenbreck	SEPA-SE
21036	Whiteadder Water at Abbey St Bathans	SEPA-SE
28023	Wye at Ashford	EA-EM
28032	Meden at Church Warsop	EA-EM
28035	Leen at Triumph Road Nottingham	EA-EM
37018	Ingrebourne at Gaynes Park	EA-HNL
38020	Cobbins Brook at Sewardstone Road	EA-HNL
39041	Lambourn at Shaw Ultrasonic	EA-T
39049	Silk Stream at Colindeep Lane	EA-HNL
39055	Yeading Brook West at North Hillingdon	EA-HNL
39088	Chess at Rickmansworth	EA-HNL
44015	Hooke at Hooke	EA-WX
47025	Wolf at Germansweek	EA-DC
48013	Cober at Boscadjack	EA-DC
54019	Avon at Stareton	EA-WM
60006	Gwili at Glangwili	NRW
60013	Cothi at Pont Ynys Brechfa	NRW
61002	Eastern Cleddau at Canaston Bridge	NRW
63001	Ystwyth at Pont Llolwyn	NRW
63003	Wyre at Llanrhystud	NRW
72006	Lune at Kirkby Lonsdale	EA-CL
72016	Wyre at Scorton Weir	EA-CL
77001	Esk at Netherby	EA-CL
83005	Irvine at Shewalton	SEPA-SW
83013	Irvine at Glenfield	SEPA-SW
84011	Gryfe at Craigend	SEPA-SW
84020	Glazert Water at Milton of Campsie	SEPA-SW
85001	Leven at Linnbrane	SEPA-SW