National River Flow Archive

NERC Centre for Ecology & Hydrology

WINFAP-FEH DATA FILES VERSION 5

Note on changes from v4.1

VERSION: 1.0

STATUS: FINAL

DATE: APRIL 2017

AUTHOR: KATIE MUCHAN, CATH SEFTON, STEVE TURNER, OLI SWAIN, MATT FRY, NURIA BACHILLER-JARENO

DOCUMENT VERSION CONTROL

Version	Date	Author	Description
1.0	APRIL 2017	KATIE MUCHAN, CATH SEFTON, STEVE TURNER, OLI SWAIN, MATT FRY, NURIA BACHILLER-JARENO	

TABLE OF CONTENTS

1 INTRODUCTION

Version 5 of the WINFAP-FEH Data Files is the second version released since stewardship of the national peak flows database was passed to the National River Flow Archive (NRFA).

Version 5 of the WINFAP-FEH files contain AMAX and POT data for 951 gauging stations, of which 648 are in England, 155 are in Scotland, 104 are in Wales and 44 are in Northern Ireland. A total of 558 stations are recommended for use in pooling groups ('Suitable for Pooling'), 297 stations are 'Suitable for QMED' and 96 stations are 'Suitable for Neither'.

Version 5 contains one additional water year of data for stations in England and Northern Ireland (updated to 30th September 2015, see section 3), modifications to existing time series (see section 4) and full period of record data review for a subset of stations in Wales and Scotland (see section 5). Version 5 also contains updates to catchment descriptors using new station locations (see section 6).

2 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 4.1 of the WINFAP-FEH files. Key changes are noted in this section.

2.1 Removal of Gauging Stations

Seven stations have been removed from the dataset due to concerns regarding data quality. Details of these stations are provided in Table 1. Users should note that six of these stations remain on the NRFA website as they also provide daily flow data.

Table 1: Stations removed from the dataset in version 5

Station Number	Station Name	Measuring Authority	NRFA daily flow station	Comment
22801	Pont at Stamfordham	EA-NE	N	Poor performance and lack of satisfactory rating.
27038	Costa Beck at Gatehouses	EA-Y	Y	Station badly affected by weed growth.
39031	Lambourn at Welford	EA-T	Y	Non-standard gauging structure and missing data during large high flow events.
39032	Lambourn at East Shefford	EA-T	Y	Short period of record with missing data during large high flow events.
55003	Lugg at Lugwardine	EA-WM	Y	Significant and frequent bypassing at site.
63002	Rheidol at Llanbadarn Fawr	NRW	Y	Lack of satisfactory rating.
203039	Clogh at Tullynewey	RA	Y	Under-estimation of high flows.

2.2 Addition of Gauging Stations

No stations have been added to the dataset in version 5.

2.3 Closure of Gauging Stations

Two stations have been closed, listed in Table 2. Previously recorded flow data for these stations are still contained in the WINFAP-FEH files and shown on the NRFA website, but there will be no further updates in future.

Table 2: Gauging stations closed in version 5

Station Number	Station Name	Measuring Authority	NRFA daily flow station	Comment
42005	Wallop Brook at Broughton	EA-SSD	Y	Station closed, no peak flow data are presented after water year 2012/2013.
70003	Douglas at Wigan	EA-CL	Y	No peak flow data are presented after water year 2010/11 due to the completion of Wigan Flood Control Scheme.

2.4 Changes to FEH Indicative Suitabilities

Indicative suitabilities have changed at three stations in England and seven in Scotland, listed in Table 3.

Table 3: Stations with changes to indicative suitability in version 5

NRFA Station	Station Name	Measuring Authority	V4.1 Suitability		V5 Suitability	
			QMED	POOLING	QMED	POOLING
4003	Alness at Alness	SEPA-N	Yes	Yes	Yes	No
6008	Enrick at Mill of Tore	SEPA-N	Yes	Yes	Yes	No
8002	Spey at Kinrara	SEPA-N	Yes	Yes	Yes	No
9002	Deveron at Muiresk	SEPA-N	Yes	Yes	Yes	No
21009	Tweed at Norham	SEPA-S	Yes	Yes	Yes	No
21011	Yarrow Water at Philiphaugh	SEPA-S	Yes	Yes	Yes	No
28015	Idle at Mattersey	EA-EM	No	No	Yes	Yes
44014	Piddle at Briantspuddle	EA-WX	Yes	Yes	Yes	No
51002	Horner Water at West Luccombe	EA-WX	Yes	Yes	Yes	No
85003	Falloch at Glen Falloch	SEPA-S	Yes	Yes	Yes	No

2.5 Combined Peak Flow Time Series from Multiple Stations

No changes have been made to these in version 5 of the WINFAP-FEH files. See the release note for v3.3.2 for the most recent changes.

2.6 Component Stations

No changes have been made to the stations that the NRFA treats as combined sites since v4.1.

At a number of 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 a number of such stations around the UK that the NRFA and/or Measuring Authority treat as a combined station.

In some cases, the peak flow data may be derived from only one component of the combined dataset and as such the source for the POT and AMAX data may not be the same as that presented for the daily flow record.

2.7 Stations Where No POT Data are Presented

No POT data are presented on the NRFA website or given in the WINFAP-FEH files for stations listed in Annex 1. No stations were added to the list in version 5.

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.

3 ANNUAL UPDATE

As part of the new stewardship arrangements for the national peak flows dataset put in place when CEH took over the management as part of the NRFA, 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.

3.1 Extension of AMAX and POT Records

The version 5 files contain AMAX and POT time-series data updated to 30 September 2015 for gauging stations in England and Northern Ireland, with the exception of fifteen stations that were not able to be updated due to issues in the hydrometric archive (Table 4). An annual update was also carried out for a subset of stations in Wales and Scotland as part of the Data Review process (see section 5).

Table 4: Stations not updated in version 5

Station Number	Station Name	Measuring Authority
25011	Langdon Beck at Langdon	EA-NE
27835	Calder at Dewsbury	EA-Y
31026	Egleton Brook at Egleton	EA-LN
37014	Roding at High Ongar	EA-HNL
38002	Ash at Mardock	EA-HNL
39003	Wandle at South Wimbledon	EA-KSL
39007	Blackwater at Swallowfield	EA-T
39008	Thames at Eynsham	EA-T
40003	Medway at Teston / East Farleigh	EA-KSL
40004	Rother at Udiam	EA-KSL
40005	Beult at Stilebridge	EA-KSL
40006	Bourne at Shadlow	EA-KSL
40007	Medway at Chafford / Colliersland Bridge	EA-KSL
40010	Eden at Penshurst / Vexour Bridge	EA-KSL
71003	Croasdale Beck at Croasdale Flume	EA-CL

4 MODIFICATIONS TO EXISTING TIME SERIES

4.1 POT Independence

For stations in England operated by the Environment Agency, 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 last year and under the HiFlows-UK initiative may also have utilised the 'both peaks rule'.

In this update, the rule has been applied at all Environment Agency operated stations to POT events for water year 2014/2015. Additionally, for the stations listed in Table 5, due to changes to stage-discharge relationships (see section 4.5) 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 therefore vary throughout the flow record.

No changes have been made to the independence extraction criteria for POT data from other Measuring Authorities in Scotland, Northern Ireland or Wales.

Table 5: Stations and time periods with additional POT independence changes

Station Number	Station Name	Measuring Authority	Start date of POT independence change
25006	Greta at Rutherford Bridge	EA-NE	01/10/2008
27003	Aire at Beal Weir	EA-Y	14/09/1993
27023	Dearne at Barnsley Weir	EA-Y	24/03/1965
27035	Aire at Kildwick Bridge	EA-Y	09/07/1971
27086	Skell at Alma Weir	EA-Y	22/11/2012
28008	Dove at Rocester Weir	EA-WM	25/11/2011
28012	Trent at Yoxall	EA-WM	01/10/2010
28018	Dove at Marston on Dove	EA-WM	07/11/2000
28024	Wreake at Syston Mill	EA-WM	30/11/2009
28033	Dove at Hollinsclough	EA-WM	05/12/1972
28053	Penk at Penkridge	EA-WM	01/01/2012
28061	Churnet at Basford Bridge	EA-WM	06/11/2000
28095	Tame at Hopwas Bridge	EA-WM	01/01/1998
33030	Clipstone Brook at Clipstone	EA-EA	01/10/2012
39035	Churn at Cerney Wick	EA-T	01/01/2013
43806	Wylye at Brixton Deverill	EA-WX	Full period of record
45004	Axe at Whitford	EA-DC	Full period of record
47024	Tavy at Tavistock Abbey Bridge	EA-DC	Full period of record
48006	Cober at Helston Country Bridge	EA-DC	01/10/2012
50005	West Okement at Vellake	EA-DC	01/10/2012
50010	Torridge at Rockhay Bridge	EA-DC	01/10/2012
52004	Isle at Ashford Mill	EA-WX	07/03/1972
70004	Yarrow at Croston Mill	EA-CL	01/10/2013
75005	Derwent at Portinscale	EA-CL	01/10/2011

4.2 POT Thresholds

The POT Threshold has changed at one station in England, listed in Table 6.

Table 6: Stations with changes to POT Thresholds in version 5

NRFA Station	Station Name	Measuring Authority	V4.1 POT Threshold	V5 POT Threshold
54004	Sowe at Stoneleigh	EA-WM	14.693	20.18

4.3 Water Year Definition

There were a number of events in the dataset found to be between 00:00 and 09:00 on the 1st October, but assigned to the wrong water year in the AMAX series. These events have been checked and corrected and as a result, AMAX time series have changed at the stations listed in Table 7.

Table 7: Stations with changes to AMAX time series in version 5

Station Number	Station Name	Measuring Authority
6008	Enrick at Mill of Tore	SEPA-N
12007	Dee at Mar Lodge	SEPA-E
15013	Almond at Almondbank	SEPA-E
39036	Law Brook at Albury	EA-T
46006	Erme at Ermington	EA-DC
47011	Plym at Carn Wood	EA-DC
83005	Irvine at Shewalton	SEPA-S
84007	South Calder Water at Forgewood	SEPA-S
84011	Gryfe at Craigend	SEPA-S
84012	White Cart Water at Hawkhead	SEPA-S
84014	Avon Water at Fairholm	SEPA-S
84019	North Calder Water at Calderpark	SEPA-S
84020	Glazert Water at Milton of Campsie	SEPA-S

4.4 Minor Changes to AMAX and POT Records

Minor changes to individual events in time series were made at a small number of stations, listed in Table 8. For more significant reprocessing of time series due to rating changes, see section 4.5.

Table 8: Stations with minor changes to time series in version 5

Station Number	Station Name	Measuring Authority	Details of change
33048	Larling Brook at Stonebridge	EA-EA	Data after 01/11/2000 removed due to station closure.
72009	Wenning at Wennington	EA-CL	Data for water years 1970/1971 to 1986/1987 was not included after v3.1.2. Data is now included after discussion with the EA.
75001	St Johns Beck at Thirlmere Reservoir	EA-CL	Correction of AMAX in water year 2009/2010 from 155m^3s^{-1} to 59.84m^3s^{-1}.

4.5 Changes to Stage-Discharge Ratings and Reprocessed Data

Stage-discharge ratings have been changed for 18 stations since the last version of files were published, with the time period of re-processed flow data listed in Table 9. All stations have been re-processed to the end of the record (water year 2014/2015).

Table 9: Stations with rating changes and re-processed data in version 5

Station Number	Station Name	Measuring Authority	Start date of re-processed data
27003	Aire at Beal Weir	EA-NE	Full period of record
27023	Dearne at Barnsley Weir	EA-NE	02/02/1965
27035	Aire at Kildwick Bridge	EA-NE	09/07/1971
27086	Skell at Alma Weir	EA-NE	22/11/2012
28008	Dove at Rocester Weir	EA-WM	25/11/2011
28012	Trent at Yoxall	EA-WM	01/10/2010
28018	Dove at Marston on Dove	EA-WM	07/11/2000
28024	Wreake at Syston Mill	EA-EM	30/11/2009
28033	Dove at Hollinsclough	EA-WM	Full period of record
28053	Penk at Penkridge	EA-WM	01/01/2012
28061	Churnet at Basford Bridge	EA-WM	06/11/2000
28095	Tame at Hopwas Bridge	EA-WM	01/01/1998
39035	Churn at Cerney Wick	EA-T	01/01/2013
43806	Wylye at Brixton Deverill	EA-WX	Full period of record
47024	Tavy at Tavistock Abbey Bridge	EA-DC	Full period of record
48006	Cober at Helston Country Bridge	EA-DC	01/10/2012
52004	Isle at Ashford Mill	EA-WX	Full period of record
75005	Derwent at Portinscale	EA-CL	01/10/2011

4.6 Missing Data Periods

A missing data table is provided for each station, listing the dates of known periods of missing data in the underlying 15-minute data. These are shown on the NRFA website by yellow shading on the AMAX and POT graphs. There was one change made to the missing data table for stations in England and Northern Ireland in version 5, shown in Table 10. Users should always consult the missing data table when using the data for flood estimation in WINFAP-FEH.

Table 10: Additions to the list of missing periods in version 5

NRFA Station	Station Name	Measuring Authority	Start Date	End Date	Comments
22003	Usway Burn at Shillmoor	EA-NE	01/07/1980	01/10/1999	Station closure and recommissioning.

4.7 Unrepresentative Data Periods

Some periods of data are unsuitable for use in WINFAP-FEH 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. 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 and 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, providing the length of record is reasonable. In these cases, the years of poorer quality have been rejected.

A new unrepresentative period has been added at one station in England, shown in Table 11. The end dates for ongoing unrepresentative periods at a further seven stations were extended to 30 September 2015.

Table 11: Additions to the list of unrepresentative periods in version 5

NRFA Station	Station Name	Measuring Authority	Start Date	End Date	Comments
48009	St Neot at Craigshill Wood	EA-DC	01/10/2009	30/09/2015	Flows attenuated by Colliford reservoir.

4.8 Rejected Data

AMAX and POT data that are unsuitable for use in flood estimation are marked as rejected in WINFAP-FEH files and not included in flood estimation calculations. These are shown by red bars (for AMAX) and red crosses (for POTs) on the AMAX and POT graphs respectively. All data falling within unrepresentative periods (see section 4.7 Unrepresentative Data Periods) are rejected.

In addition, where periods of missing data (see section 4.6 Missing Data Periods) are likely to have included the true AMAX, any AMAX recorded during that water year is rejected. Where the true AMAX is recorded, the event is not rejected.

Additional rejected AMAX values at two stations have been added to the list of rejected water years, listed in Table 12 and two have been removed, listed in Table 13.

Table 12: AMAX data now classed as rejected in version 5

NRFA Station	Station Name	Measuring Authority	Rejected water year(s)
45002	Exe at Stoodleigh	EA-DC	1959/1960
45009	Exe at Pixton	EA-DC	1965/1966

Table 13: AMAX data no longer classed as rejected in version 5

NRFA Station	Station Name	Measuring Authority	Rejected water year(s)
27088	Calder at Mytholmroyd	EA-Y	1988/1989
60001	Tywi at Ty Castell	NRW	1983/1984

4.9 Datum Changes

A short table is provided on the NRFA website for each station, which details the datum history over the period of record, with dates of applicability. The datum history has been updated at 66 stations listed in Annex 2.

5 PERIOD OF RECORD REVIEW

As part of the new stewardship arrangements for the national peak flows dataset put in place when CEH took over the management as part of the NRFA, a programme of period of record reviews has been implemented. It is intended that a subset of the NRFA Peak Flow stations are subject to Data Review each year and that the resulting changes will be released in a separate release to the annual update. This year however, the annual update and data review changes are being released together.

The Data Review covers the full period of record, including extension of recent and where applicable, early records, and the accompanying metadata. Changes since the release of v4.1 of the WINFAP-FEH files arising from the Data Review are outlined in this section.

5.1 Stations Included

The period of record Data Review covered 28 stations in Scotland and 19 stations in Wales, listed in Table 14.

Table 14 Stations included in the period of record review in version 5

Station Number	Station Name	Measuring Authority	Start date	End date
3002	Carron at Sgodachail	SEPA-N	1973/1974	2014/2015
3003	Oykel at Easter Turnaig	SEPA-N	1977/1978	2014/2015
4003	Alness at Alness	SEPA-N	1973/1974	2014/2015
6008	Enrick at Mill of Tore	SEPA-N	1979/1980	2014/2015
7001	Findhorn at Shenachie	SEPA-N	1960/1961	2014/2015
7002	Findhorn at Forres	SEPA-N	1958/1959	2014/2015
7004	Nairn at Firhall	SEPA-N	1978/1979	2014/2015
7005	Divie at Dunphail	SEPA-N	1982/1983	2014/2015
8002	Spey at Kinrara	SEPA-N	1951/1952	2014/2015
8004	Avon at Delnashaugh	SEPA-N	1952/1953	2013/2014
8005	Spey at Boat of Garten	SEPA-N	1951/1952	2014/2015
8006	Spey at Boat o Brig	SEPA-N	1952/1953	2014/2015
8007	Spey at Invertruim	SEPA-N	1952/1953	2014/2015
8010	Spey at Grantown	SEPA-N	1951/1952	2014/2015
9001	Deveron at Avochie	SEPA-N	1959/1960	2014/2015
9002	Deveron at Muiresk	SEPA-N	1959/1960	2014/2015
9003	Isla at Grange	SEPA-N	1959/1960	2014/2015
20003	Tyne at Spilmersford	SEPA-E	1961/1962	2014/2015
20007	Gifford Water at Lennoxlove	SEPA-E	1973/1974	2014/2015
21003	Tweed at Peebles	SEPA-S	1939/1940	2014/2015
21006	Tweed at Boleside	SEPA-S	1960/1961	2014/2015
21009	Tweed at Norham	SEPA-S	1959/1960	2014/2015
21011	Yarrow Water at Philiphaugh	SEPA-S	1961/1962	2014/2015
54025	Dulas at Rhos-y-pentref	NRW	1969/1970	2014/2015
55029	Monnow at Grosmont	NRW	1973/1974	2014/2015
56001	Usk at Chainbridge	NRW	1956/1957	2014/2015
56004	Usk at Llandetty	NRW	1965/1966	2014/2015
57007	Taff at Fiddlers Elbow	NRW	1973/1974	2014/2015
57015	Taff at Merthyr Tydfil	NRW	1978/1979	2014/2015
58001	Ogmore at Bridgend	NRW	1960/1961	2014/2015
58002	Neath at Resolven	NRW	1960/1961	2014/2015

Station Number	Station Name	Measuring Authority	Start date	End date
58005	Ogmore at Brynmenyn	NRW	1969/1970	2014/2015
58008	Dulais at Cilfrew	NRW	1971/1972	2014/2015
62002	Teifi at Llanfair	NRW	1970/1971	2014/2015
64001	Dyfi at Dyfi Bridge	NRW	1962/1963	2014/2015
65001	Glaslyn at Beddgelert	NRW	1967/1968	2014/2015
65006	Seiont at Peblig Mill	NRW	1975/1976	2014/2015
66001	Clwyd at Pont-y-Cambwll	NRW	1973/1974	2014/2015
66006	Elwy at Pont-y-Gwyddel	NRW	1973/1974	2014/2015
66011	Conwy at Cwmlanerch	NRW	1964/1965	2014/2015
67015	Dee at Manley Hall	NRW	1969/1970	2014/2015
67018	Dee at New Inn	NRW	1968/1969	2014/2015
84001	Kelvin at Killermont	SEPA-S	1947/1948	2014/2015
84012	White Cart Water at Hawkhead	SEPA-S	1962/1963	2014/2015
85003	Falloch at Glen Falloch	SEPA-S	1970/1971	2014/2015
94001	Ewe at Poolewe	SEPA-N	1972/1973	2014/2015
95001	Inver at Little Assynt	SEPA-N	1976/1977	2014/2015

5.2 Extension and reduction of AMAX and POT Records

For 26 of the 28 stations in Scotland, the period of record (which in the v4.1 WINFAP-FEH release ended with water year 2005/2006) has been extended by nine water years to end with water year 2014/2015. For 17 of the 19 stations in Wales, the period of record has been extended by one year to end with water year 2014/2015.

The four exceptions are shown in Table 15. In addition, at the Usk at Llandetty (56004), data was removed for the period 1985-1999 because the station was downgraded to level-only during this time.

Table 15 Stations with an exception to the regional extension of period of record in version 5

NRFA Station	Station Name	Measuring Authority	V4.1 period	V5 period
8004	Avon at Delnashaugh	SEPA-N	1951/1952 to 2005/2006	1952/1953 to 2013/2014
64001	Dyfi at Dyfi Bridge	NRW	1962/1963 to 2009/2010	1962/1963 to 2014/2015
65001	Glaslyn at Beddgelert	NRW	1961/1962 to 2013/2014	1967/1968 to 2014/2015
85003	Falloch at Glen Falloch (POT*)	SEPA-S	1970/1971 to 2005/2006	1978/1979 to 2014/2015

*Pre-digital period is POT excluded due to the reduction in threshold.

5.3 Digitisation of Record

At 11 stations in Scotland, the early record has been digitised, time periods of digitised data are listed in Table 16. For these time periods, POT and AMAX data had previously been derived from paper charts. In version 5, data for these periods has now been derived from a digitised version of these, allowing re-processing of the existing POT and AMAX time series.

Table 16: Stations with digitised early record in version 5

NRFA Station	Station Name	Measuring Authority	Period of digitised data
3002	Carron at Sgodachail	SEPA-N	1973-1982
4003	Alness at Alness	SEPA-N	1973-1982
7001	Findhorn at Shenachie	SEPA-N	1961-1982
7002	Findhorn at Forres	SEPA-N	1959-1982
8004	Avon at Delnashaugh	SEPA-N	1952-1986
8006	Spey at Boat o Brig	SEPA-N	1953-1986
9001	Deveron at Avochie	SEPA-N	1959-1989
9002	Deveron at Muiresk	SEPA-N	1960-1987
21003	Tweed at Peebles	SEPA-E	1960-1986
21009	Tweed at Norham	SEPA-E	1959-1990
94001	Ewe at Poolewe	SEPA-S	1972-1982

5.4 Changes to Stage-Discharge Ratings

Rating histories for the full period of record were reviewed at all 28 of the Data Review stations in Scotland, and the data reprocessed. Where appropriate, a single peak flow rating was applied across the full period of record.

In Wales, the peak flow rating history has changed at one station, with the period of reprocessed data shown in Table 17.

Table 17 Station with rating change and re-processed data in version 5

Station Number	Station Name	Measuring Authority	Period
57015	Taff at Merthyr Tydfil	NRW	01/09/1978 – 05/09/2008

5.5 Missing Data Periods

A missing data table is provided for each station on the website, listing the dates of known periods of missing data in the underlying 15-minute data. These are shown on the NRFA website by yellow shading on the AMAX and POT graphs. This table has been updated for the 28 Data Review stations in Scotland shown in Table 14 and missing periods have been added for seven of the Data Review stations in Wales, shown in Table 18. Users should always consult the missing data table when using the data for flood estimation in WINFAP-FEH.

Table 18 Missing data periods added to stations in Wales in version 5

NRFA Station	Station Name	Measuring Authority	Start Date	End Date
56001	Usk at Chainbridge	NRW	01/10/1969 01/10/1976	01/10/1971 01/10/1977
56004	Usk at Llandetty	NRW	01/11/1981	01/01/2000
58001	Ogmore at Bridgend	NRW	01/10/1986	05/11/1986
58002	Neath at Resolven	NRW	01/09/1977	01/08/1978
58005	Ogmore at Brynmenyn	NRW	15/10/1986	01/11/1986
58008	Dulais at Cilfrew	NRW	11/05/1983 28/05/1983 06/07/1983 20/08/1983	20/05/1983 09/06/1983 19/08/1983 21/08/1983
62002	Teifi at Llanfair	NRW	01/11/1982	12/04/2002

5.6 Unrepresentative Data Periods

Some periods of data are unsuitable for use in WINFAP-FEH 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. 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 and 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, providing the length of record is reasonable. In these cases, the years of poorer quality have been rejected.

New unrepresentative periods have been added at three stations in Scotland and one in Wales, shown in Table 19.

Table 19: Additions to the list of unrepresentative periods in version 5

NRFA Station	Station Name	Measuring Authority	Start Date	End Date	Comments
8007	Spey at Invertrium	SEPA-N	01/01/1995	28/10/1998	Low confidence in stage measurements prior to station closure and rebuild.
21003	Tweed at Peebles	SEPA-S	01/10/1939	11/07/1959	Station moved 360m downstream, from Priorsford Bridge.
67018	Dee at New Inn	NRW	20/01/1969	01/01/1979	No satisfactory rating pre-1979.
84001	Kelvin at Killermont	SEPA-S	15/09/1948	29/06/1962	Station moved 300m upstream.

5.7 Rejected Data

AMAX and POT data that are unsuitable for use in flood estimation are marked as rejected in WINFAP-FEH files and not included in flood estimation calculations. These are shown by red bars (for AMAX) and red crosses (for POTs) on the AMAX and POT graphs respectively. All data falling within unrepresentative periods (section 5.6 Unrepresentative Data Periods) are rejected.

In addition, where periods of missing data (see section 5.5 Missing Data Periods) are likely to have included the true AMAX, any AMAX recorded during that water year is rejected. Where the true AMAX is recorded, the event is not rejected.

Additional rejected AMAX values at six different stations have been added to the list of rejected water years, listed in Table 20, and three have been removed, listed in Table 21.

Table 20: AMAX data now classed as rejected in version 5

NRFA Station	Station Name	Measuring Authority	Rejected water year(s)
56001	Usk at Chainbridge	NRW	1958/1959
56004	Usk at Llandetty	NRW	1979/1980
62002	Teifi at Llanfair	NRW	1982/1983, 2001/2002
65001	Glaslyn at Beddgelert	NRW	1986/1987
66001	Clwyd at Pont-y-Cambwll	NRW	1982/1983, 1984/1985
84012	White Cart Water at Hawkhead	SEPA-S	1989/1990

Table 21: AMAX data no longer classed as rejected in version 5

NRFA Station	Station Name	Measuring Authority	Rejected water year(s)
20003	Tyne at Spilmersford	SEPA-E	1961/1962
64001	Dyfi at Dyfi Bridge	NRW	2009/2010

5.8 Datum Changes

A short table is provided on the NRFA website for each station, which details the datum history over the period of record, with dates of applicability. The datum history has been updated at 5 stations listed in Table 22.

Table 22: Stations with changes to datum history as part of the data review in version 5.

NRFA Station	Station Name	Measuring Authority
21003	Tweed at Peebles	SEPA-E
84012	White Cart Water at Hawkhead	SEPA-S
84014	Avon Water at Fairholm	SEPA-S
85003	Falloch at Glen Falloch	SEPA-S
95001	Inver at Little Assynt	SEPA-N

5.9 POT Thresholds

The POT Threshold has changed at two stations in Scotland, listed in Table 23.

Table 23: Stations with changes to POT Thresholds in version 5

NRFA Station	Station Name	Measuring Authority	New POT Threshold
21009	Tweed at Norham	SEPA	400
85003	Falloch at Glen Falloch	SEPA	130

6 CATCHMENT DESCRIPTORS

The NRFA undertook a project to update grid references for all stations on the archive and have now used those to calculate new catchment boundaries, catchment areas, statistics and FEH descriptors. The updated grid references have already been released, version 5 of the peak flows dataset includes the updated catchment areas and FEH descriptors. Details of how the FEH catchment descriptors statistics are derived can be found on the NRFA website here, for more information about the catchment boundaries and other statistics are derived see here.

6.1 Differences Between v4.1 and v5

Each new location, catchment boundary and catchment area were checked before deriving updated catchment statistics and FEH descriptors. These new values were also checked against the previous version for any significant differences. Table 24 lists significant changes (>5%) to highlight to users of the dataset.

FARL values for all stations where the representative period covers a pre-reservoir flow regime have been manually set to a pre-reservoir FARL values, as was done for previous versions of the dataset.

Table 24: Stations with significant changes to catchment descriptors

NRFA Station	Station Name	Measuring Authority	Descriptor changed	Comment
27088	Calder at Mytholmroyd	EA-Y	Catchment area (15% reduction)	Previous location created a catchment boundary including the Cragg Brook, however the station is located upstream of this confluence.
31026	Egleton Brook at Egleton	EA-LN	Catchment area (16% reduction)	New catchment boundary and area confirmed, unknown source of old catchment area.
33052	Swaffham Lode at Swaffham Bulbeck	EA-EA	Catchment area (36% reduction)	New catchment boundary and area confirmed, unknown source of old catchment area.
39055	Yeading Brook West at North Hillingdon	EA-HNL	Catchment area (92% reduction) and all FEH descriptors	Previous location created a catchment boundary including the Yeading Brook and River Crane, however the station is located upstream of the confluence.
43014	East Avon at Upavon	EA-WX	Several FEH descriptors (>5% change)	Previous descriptors thought to be a copy of West Avon at Upavon (43017).
47013	Withey Brook at Bastreet	EA-DC	Catchment area (13% reduction)	Previous location created a catchment boundary that included a tributary, however the station is located upstream of this confluence.
48011	Fowey at Restormel	EA-DC	FARL	FARL set to pre-reservoir value to reflect period of representative data.
52017	Congresbury Yeo at Iwood	EA-WX	Catchment area (8% reduction)	New location changes boundary at catchment outlet.
61003	Gwaun at Cilrhedyn Bridge	NRW	Catchment area (7% reduction)	Previous location created a catchment boundary that included a tributary, however the station is located upstream of this confluence.
89004	Strae at Glen Strae	SEPA-S	FPEXT (6% reduction)	Station location has moved upstream .

ANNEX 1 POT EXCLUDED STATIONS

NRFA Station	Station Name	Measuring Authority
26003	Foston Beck at Foston Mill	EA-NE
26009	West Beck at Snakeholme Lock	EA-NE
26010	Driffield Canal at Snakeholme Lock	EA-NE
26802	Gypsey Race at Kirby Grindalythe	EA-NE
26803	Water Forlornes at Driffield	EA-NE
27038	Costa Beck at Gatehouses	EA-NE
27073	Brompton Beck at Snainton Ings	EA-NE
29005	Rase at Bishopbridge	EA-LN
30005	Witham at Saltersford Total	EA-LN
30006	Slea at Leasingham Mill	EA-LN
30013	Heighington Beck at Heighington	EA-LN
30015	Cringle Brook at Stoke Rochford	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
33052	Swaffham Lode at Swaffham Bulbeck	EA-EA
33054	Babingley at Castle Rising	EA-EA
34007	Dove at Oakley Park	EA-EA
34018	Stiffkey at Warham	EA-EA
35003	Alde at Farnham	EA-EA
35004	Ore at Beversham Bridge	EA-EA
36002	Glem at Glemsford	EA-EA
36003	Box at Polstead	EA-EA
36005	Brett at Hadleigh	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
36015	Stour at Lamarsh	EA-EA
37003	Ter at Crabbs Bridge	EA-EA
37005	Colne at Lexden	EA-EA
37009	Brain at Guithavon Valley	EA-EA
37010	Blackwater at Appleford Bridge	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
38011	Mimram at Fulling Mill	EA-HNL
39010	Colne at Denham	EA-HNL
39021	Cherwell at Enslow Mill	EA-T

39033	Winterbourne Stream at Bagnor	EA-T
39034	Evenlode at Cassington Mill	EA-T
39037	Kennet at Marlborough	EA-T
39089	Gade at Bury Mill	EA-HNL
39095	Quaggy at Manor House Gardens	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
44002	Piddle at Baggs Mill	EA-WX
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
54027	Frome at Ebley Mill	EA-WM
55035	Iago at Iago flume	CEH
67020	Dee at Chester Weir	NRW
68007	Wincham Brook at Lostock Gralam	EA-GMMC
69002	Irwell at Adelphi Weir	EA-GMMC
71003	Croasdale Beck at Croasdale Flume	EA-CL
85001	Leven at Linnbrane	SEPA-W
205034	Woodburn at Control	RA
206006	Annalong at Recorder	BCDWC

ANNEX 2 STATIONS WITH CHANGES TO DATUM HISTORY

NRFA Station	Station Name	Measuring Authority
23002	Derwent at Eddys Bridge	EA-NE
25012	Harwood Beck at Harwood	EA-NE
25020	Skerne at Preston le Skerne	EA-NE
25021	Skerne at Bradbury	EA-NE
26802	Gypsey Race at Kirby Grindalythe	EA-Y
26803	Water Forlornes at Driffield	EA-Y
27002	Wharfe at Flint Mill Weir	EA-Y
27009	Ouse at Skelton	EA-Y
27021	Don at Doncaster	EA-Y
27023	Dearne at Barnsley Weir	EA-Y
27025	Rother at Woodhouse Mill	EA-Y
27026	Rother at Whittington	EA-Y
27028	Aire at Armley	EA-Y
27030	Dearne at Adwick	EA-Y
27031	Colne at Colne Bridge	EA-Y
27032	Hebden Beck at Hebden	EA-Y
27033	Sea Cut at Scarborough	EA-Y
27035	Aire at Kildwick Bridge	EA-Y
27040	Doe Lea at Staveley	EA-Y
27041	Derwent at Buttercrambe	EA-Y
27043	Wharfe at Addingham	EA-Y
27051	Crimple at Burn Bridge	EA-Y
27052	Whitting at Sheepbridge	EA-Y
27053	Nidd at Birstwith	EA-Y
27059	Laver at Ripon	EA-Y
27071	Swale at Crakehill	EA-Y
27079	Calder at Methley	EA-Y
27080	Aire at Lemonroyd	EA-Y
27083	Foss at Huntington	EA-Y
27084	Eastburn Beck at Crosshills	EA-Y
27086	Skell at Alma Weir	EA-Y
27087	Derwent at Low Marishes	EA-Y
27088	Calder at Mytholmroyd	EA-Y
27089	Wharfe at Tadcaster	EA-Y
27090	Swale at Catterick Bridge	EA-Y
27835	Calder at Dewsbury	EA-Y
28043	Derwent at Chatsworth	EA-EM
43010	Allen at Loverley Farm	EA-WX
54041	Tern at Eaton upon Tern	EA-WM
68021	Arrowe Brook at Acton Lane	EA-GMMC
69005	Glaze Brook at Little Woolden Hall	EA-GMMC
69012	Bollin at Wilmslow	EA-GMMC
69015	Etherow at Compstall	EA-GMMC
69022	Irwell at Irwell Vale	EA-GMMC
69027	Tame at Portwood	EA-GMMC
69044	Irwell at Bury Ground	EA-GMMC

69047	Roch at Littleborough	EA-GMMC
69803	Roch at Rochdale	EA-GMMC
70002	Douglas at Wanes Blades Bridge	EA-CL
70004	Yarrow at Croston Mill	EA-CL
71010	Pendle Water at Barden Lane	EA-CL
72005	Lune at Killington	EA-CL
72007	Brock at upstream of A6	EA-CL
72009	Wenning at Wennington	EA-CL
72014	Conder at Galgate	EA-CL
72016	Wyre at Scorton Weir	EA-CL
73011	Mint at Mint Bridge	EA-CL
74002	Irt at Galesyke	EA-CL
74006	Calder at Calder Hall	EA-CL
74007	Esk at Cropple How	EA-CL
75001	St Johns Beck at Thirlmere Reservoir	EA-CL
76007	Eden at Sheepmount	EA-CL
76008	Irthing at Greenholme	EA-CL
76011	Coal Burn at Coalburn	EA-CL
76014	Eden at Kirkby Stephen	EA-CL
76811	Dacre Beck at Dacre Bridge	EA-CL