Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

For the future of our environment

Future Flood Maps: Summary

25 February 2025

1. Introduction

The Flood Risk Management (Scotland) Act 2009 (FRM Act) introduced a co-ordinated and partnership approach to how we sustainably tackle flood risk in Scotland. To fulfil this, we are considering all sources of flooding when making flood risk management decisions.

A key outcome of the FRM Act is the production of flood hazard and flood risk maps for Scotland. These maps provide the most comprehensive national source of data on flood hazard and risk and include information on different likelihoods of flooding.

The Climate Change (Scotland) Act 2009 sets out responsibilities for climate change mitigation and adaptation and places duties on the public bodies relating to climate change. These include acting in the way best calculated to help deliver the Scottish Climate Change Adaptation Programme and to act in the way they consider the most sustainable.

SEPA’s climate change commitment statement includes a commitment to using our flooding roles to greatest advantage to improve climate resilience for Scotland’s communities. This includes preparing information that can be used by people to better understand the impacts of climate change on flood risk and to factor this into their decisions.

The flood map information available now includes future flood hazard maps (referred to as future flood maps hereafter) for a single climate change scenario for the medium likelihood event for river, coastal and surface water sources of flooding.

The availability of a climate change scenario for the flood hazard maps for river, coastal and surface water flood sources helps to support an improved understanding of future flood hazard and flood risk which, in turn, enables more informed decisions to be made about long term flood risk management planning.

This summary provides information on the available future flood map scenarios including the climate change projections used. Previous knowledge of flood modelling and mapping is beneficial when using this summary.

2. Climate change scenarios

The river, coastal and surface water future flood maps were developed following the same modelling and mapping approaches as for the present day flood hazard map scenarios but with peak flows, rainfall and extreme sea levels revised to reflect projected changes under a climate change scenario. For further information on the adopted flood modelling and mapping approaches reference should be made to separate summary documents for each flood source.

The leading source of climate information for the UK is the UK Climate Projections. The scenarios used within most of the future flood map scenarios are based on UK Climate Projections 2009 (UKCP09) (Murphy, et al., 2009) which was the best information available when the river and coastal national modelling was undertaken (2011-2013).

Since then, an updated set of projections the UK Climate Projections 2018 (UKCP18) (Lowe, et al., 2018) was published. UKCP18 projections informed the development of:

- the future coastal flood maps for the Outer Hebrides and Loch Etive.
- the future surface water and small watercourses flood maps.

2.1 Interpreting projections

Projections are estimates of future climate outcomes. They are produced for a range of potential future climates; however, they may not capture all possible outcomes and the real world may follow an alternative pathway.

Probabilistic projections assign probabilities to different possible climate change outcomes, which indicate how much evidence from climate models and observations supports a particular future outcome within that scenario (Murphy, et al., 2009).

For each scenario, a spread of modelled climate change outcomes are produced by running a large number of variants of a model with different input values. These are then used to generate a probability distribution. The 50th percentile, sometimes called a central estimate, could be considered a level for which as much evidence is produced for a lower outcome as for a higher one within that scenario.

2.2 Emissions scenario

The impact of climate change on flood risk will depend on how much global action there is to reduce greenhouse gas emissions and on characteristics of a local area.

Future greenhouse gas emissions depend on a range of social, economic and technological factors, including for example population and economic growth, as well as unknowns about how the climate system responds. To predict future climate, certain assumptions about social, economic and physical changes to our environment that will influence climate change are needed. For this reason, climate projections are produced for different scenarios for the amount of greenhouse gases in the atmosphere.

The majority of SEPA's future river and coastal flood maps have been prepared using projected changes in river flow and sea levels under the UKCP09 **High emissions scenario**[1]. This scenario is based on the Special Report on Emissions Scenarios A1FI scenario used in the Intergovernmental Panel on Climate Change's 4th Assessment report (IPCC AR4). The High emissions scenario is a storyline where greenhouse gas emissions continue to rise, with no action taken to mitigate climate change, leading to a greater global temperature increase.

The future coastal flood maps for the Outer Hebrides and Loch Etive used projected changes in sea levels based upon UKCP18 projections using Representative Concentration Pathway 8.5 (RCP8.5). This scenario is used in the Intergovernmental Panel on Climate Change's 5th Assessment report (IPCC AR5). RCP 8.5 assumes limited efforts to mitigate climate change, so that greenhouse gas levels in the atmosphere will continue to increase[2].

[1] More information and explanation of UKCP09 probabilistic projections and emissions scenarios can be found in the UKCP09 Projections report.

[2] Further information on the Representative Concentration Pathways used in the UK Climate Projections are available through the UKCP18 website.

The future surface water flood maps used rainfall intensity uplifts based on the FUTURE-DRAINAGE project which used analysis of the UKCP18 UKCP Local projections for **RCP8.5**[3],[4].

While the future flood maps have each been produced **for a single emissions scenario,** the actual level of change in flood hazard will depend on future emissions, climate response and actions we take to manage future flood risk. However, the maps allow people to see where climate change may increase flood risk in Scotland.

The use of high emissions scenarios such as those listed above is considered to be appropriate for strategic level flood hazard mapping as the maps can help inform significant and long-lasting flood risk management decisions.

The following sections detail the climate change scenarios used within the future flood maps.

Please note however, there are differences between the scenarios used within the future flood maps and the allowances contained in SEPA's *"Climate change allowances for flood risk assessment in land use planning guidance".*

Planning authorities should refer to the information on SEPA's Land Use Planning Guidance web pages.

[3] Fowler H. et al., July 2021, FUTURE-DRAINAGE: ensemble climate change rainfall estimates for sustainable drainage, Newcastle University, [https://www.ukclimateresilience.org/projects/future-drainage-ensemble-climate-change-rainfall-estimates-for-sustainable-drainage/].

[4] Dale et al. 2021, Guidance for water and sewerage companies and Flood Risk Management Authorities: Recommended uplifts for applying to design storms, [https://artefacts.ceda.ac.uk/badc_datadocs/future-drainage/FUTURE_DRAINAGE_Guidance_for_applying_rainfall_uplifts.pdf].

2.3 River

For the future river flood maps, estimates of future flood flows are generally based on an assessment of the vulnerability of Scotland's river catchments and coasts to the impacts of climate change from a 2011 study for SEPA by the UK Centre for Ecology and Hydrology.

The reference for this study is Kay, A., Crooks, S., Davies, H., & Reynard, N. (2011). An assessment of the vulnerability of Scotland's river catchments and coasts to the impacts of climate change. Wallingford: Centre for Ecology and Hydrology. The full report and a summary are available from our website**.**

The CEH 2011 study produced probabilistic estimates for changes in peak river flow for river basins across Scotland for High, Medium and Low emissions scenarios for 2020s, 2050s and 2080s time horizons. The study used the UKCP09 projections for precipitation and temperature.

Climate change uplifts from the **High emissions scenario 67th percentile**[5] for the **2080s (2070-2099 time period)** for the relevant river basin region were applied within each hydrometric area to uplift the input medium likelihood (1 in 200 year) flows to the models.

Table 1 (Appendix) indicates the river basin regions and uplifts applied.

There are a small number of locations where alternative uplifts have been used, including:

- Locations where the present day flood hazard maps have been updated but a climate change scenario consistent with that used in the national river flood mapping was not available. The mapping from other available scenarios was used as a proxy providing the uplifted flows were within 20% of the flow plus the appropriate CEH 2011 study uplift.
- Within a number of small, urbanised catchments where the river flood maps are based on outputs from surface water flood hazard modelling, 20% rainfall uplifts were used.

[5] The 67th percentile can be described as an uplift that 67% of the modelled scenarios fall below and 33% fall above within that emissions scenario i.e., unlikely to be exceeded in this emissions scenario.

Details of the locations in which an alternative uplift has been used is provided in Table 2 (Appendix).

2.4 Coastal

Climate change may impact coastal flooding through changes in mean sea level or through changes in storminess which affect surge and waves.

The future coastal flood map incorporates data from three separate studies as well as incorporating outputs from detailed local studies where appropriate:

- National coastal study developed to meet the requirements of the FRM Act (2013)
- Regional coastal study for North East Scotland and the Orkney Islands (2018)
- Regional coastal study for the Outer Hebrides (2021)

There are a small number of other locations where alternative uplifts have been used, including a small number of locations where the present day flood hazard maps were updated but the results for the same climate change scenario used in the national coastal flood mapping were not available. In these locations the mapping from other available scenarios was used as a proxy where suitably consistent with the uplift scenario used in the national coastal project. Details of the locations in which an alternative uplift has been used is provided in Table 3 (Appendix).

Sea levels are projected to continue to rise beyond 2100 for all emissions scenarios in the UKCP18 exploratory projections to 2300 (Met Office Hadley Centre, 2018b). Under the UKCP18 high emissions scenario (RCP8.5), the scenario mapped in the national coastal study and the North East Scotland regional study within the future flood map dataset is likely to be exceeded shortly after 2100.

Additional sea level rise beyond the current projected ranges cannot be ruled out as there is uncertainty regarding the Antarctic ice sheet contribution to sea level rise. (Fung, et al., 2018).

2.4.1 National Coastal Study

The UKCP09 High emissions 95th percentile relative sea level rise projections for the year 2080 were used and applied to the medium likelihood (1 in 200 year) sea levels. The uplifts were applied to the present day extreme still water level estimates from the Coastal Flood Boundary Conditions for the UK Mainland and Islands 2011 (CFB 2011)[6].

The uplift applied varied around the Scottish coastline. The 95th percentile confidence level from UKCP09 was used to allow for an increase in global sea level rise projections since the publication of UKCP09. However, there is additional uncertainty associated with ice sheet dynamics that is not fully taken account of in the projections.

Sea level rise projections under a high emissions scenario have increased in the latest UKCP18 climate projections. Initial analysis has indicated that the 95th percentile of the UKCP09 High emissions scenario for 2080 could be considered a proxy for the 50th percentile from the UKCP18 high emissions scenario (RCP8.5) sea level projections for 2100[7]. This suggests that with limited global action to tackle climate change there is a 1 in 2 chance the level of sea level rise by 2100 will be higher than that mapped in the future coastal flood maps.

2.4.2 North East Scotland Regional Study

The UKCP09 High emissions 95th percentile relative sea level rise projections for the year 2080 were used and applied to the medium likelihood (1 in 200 year) sea levels. The uplifts were applied to the present day extreme still water level estimates from the Coastal Flood Boundary Conditions for the UK Mainland and Islands 2018 (CFB 2018)[8].

The uplift applied varied around the Scottish coastline. The 95th percentile confidence level from UKCP09 was used to allow for an increase in global sea level rise projections since the

[6] *Coastal Flood Boundary conditions in the UK mainland and islands*, Environment Agency/Defra Flood and Coastal Risk Research and Development Programme.

[7] Using the UKCP18 21st Century Sea level projections (Met Office Hadley Centre, 2018)

[8] Environment Agency. Coastal flood boundary conditions for the UK: update 2018. Technical summary report. SC060064/TR6

publication of UKCP09. However, there is additional uncertainty associated with ice sheet dynamics that is not fully taken account of in the projections.

Sea level rise projections under a high emissions scenario have increased in the latest UKCP18 climate projections. Initial analysis has indicated that the 95th percentile of the UKCP09 High emissions scenario for 2080 could be considered a proxy for the 50th percentile from the UKCP18 high emissions scenario (RCP8.5) sea level projections for 2100[9]. This suggests that with limited global action to tackle climate change there is a 1 in 2 chance the level of sea level rise by 2100 will be higher than that mapped in the future coastal flood maps.

2.4.3 Outer Hebrides Regional Study

The UKCP18 RCP8.5 95th percentile relative sea level rise projections for the year 2100 was used and applied to the medium likelihood (1 in 200 year) sea levels. The uplifts were applied to the present day extreme still water level estimates from the Coastal Flood Boundary Conditions for the UK Mainland and Islands 2018 (CFB 2018)[10]. The uplift varied around the coastline of the Outer Hebrides.

2.5 Surface Water

Flood risk from surface water is expected to increase with climate change due to projected increases in rainfall intensity. Heavy rainfall events which can cause flooding in the UK are likely to become more frequent in the future (Bennet, Blenkisopp, Dale, & Gill, 2015) (Chan, Kahana, Kendon, & Fowler, 2018).

The future surface water and small watercourses flood map (referred to as the future surface water flood map hereafter) used rainfall uplifts based on analysis of uplifts for short duration

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[7] Using the UKCP18 21st Century Sea level projections (Met Office Hadley Centre, 2018)

[10] Environment Agency. Coastal flood boundary conditions for the UK: update 2018. Technical summary report. SC060064/TR6

rainfall published in 2021 by the FUTURE-DRAINAGE research project (FUTURE-DRAINAGE, 2021).

The FUTURE-DRAINAGE project used analysis of the UKCP18 high resolution (UKCP Local) projections for RCP8.5[11],[12]. The FUTURE-DRAINAGE study provided a total of 60 sets of uplifts for 5% contour intervals on a 5km grid across the UK, consisting of:

- 3 return periods (50% (2 year), 3.3% (30 year) and 1% (100 year)
- 5 storm durations (1-, 3-, 6-, 12- and 24-hour)
- 2 future time horizons (2050 and 2070)
- central and high estimates.
- 1 emissions scenario RCP8.5.

From the uplifts provided from the FUTURE-DRAINAGE project, mean rainfall intensity uplifts were calculated for each UKCP18 river basin region for the 1-, 6- and 12-hour storm durations.

The scenario used for the future surface water flood map applied the mean uplifts for the 100 year return period, 50th percentile and for the 2070 time horizon[13] to the 200 year present-day rainfall depth estimates. The 100 year uplifts were used as a proxy for 200 year uplifts since the climate model simulations were too short to allow the FUTURE-DRAINAGE analysis to produce uplifts for the 200 year event.

The modelled outputs from the three storm durations were then merged to produce a storm mosaic, taking outputs from the storm duration with the maximum predicted hazard value at each model grid cell. More information on the modelling approach for the surface water maps

[11] Fowler H. et al., July 2021, FUTURE-DRAINAGE: ensemble climate change rainfall estimates for sustainable drainage, Newcastle University, [https://www.ukclimateresilience.org/projects/future-drainage-ensemble-climate-change-rainfall-estimates-for-sustainable-drainage/].

[12] Dale et al. 2021, Guidance for water and sewerage companies and Flood Risk Management Authorities: Recommended uplifts for applying to design storms,[https://artefacts.ceda.ac.uk/badc_datadocs/future-drainage/FUTURE_DRAINAGE_Guidance_for_applying_rainfall_uplifts.pdf].

[13] 2070 is the central year for the 2061-2080 time period, which is the latest period available in the UKCP Local projections used to develop the rainfall uplifts.

can be found in the Surface Water Flooding Summary available on SEPA's Developing Our Knowledge webpage.

Uplifts from FUTURE-DRAINAGE are not available for Shetland, as UKCP18 Local 2.2km projections are not considered reliable for use over Shetland due to it being too close to the model domain boundary. In the absence of other readily usable projections for changes in sub-daily extreme rainfall for Shetland, uplift factors for Orkney were applied to Shetland as this is the nearest location for which suitable data was available.

Table 4 (Appendix) indicates the river basin region uplifts applied in the future surface water flood map. Figure 1 (Appendix) shows the UKCP18 river basin regions to which the rainfall uplifts were applied.

2.6 Small watercourses

The surface water future flood map provides indicative flood hazard information from both surface water flooding and from small watercourses which have a catchment area smaller than $10km^2$. Whilst SEPA's future river flood map shows flooding from rivers with catchment areas greater than $3km^2$.

Therefore, watercourses with catchment areas between $3km^2$ and $10km^2$ will be represented in both the future river and surface water flood maps. Different modelling approaches and input datasets were used to develop each flood map which means there may be differences in the outputs. It is recommended that users consult both the future river and surface water flood maps to understand the potential future flood risk from small watercourses.

Further information on both the river and the surface water flood map methodologies can be found in the flood map summaries on the SEPA website.

3. Caveats

3.1 Future flood map data not available areas

There are a small number of locations for which suitable future flood map data is not available. These locations are identified using the Future Flood Data Not Available layer. Data for the present day flood maps will still be available in these areas. The lack of future flood map data in these locations does not indicate that there is no future flood risk.

As part of our ongoing flood map improvement programme, we will look to address the lack of suitable future scenario flood data and work with our flood risk management partners to improve the flood maps in these areas.

As outlined in section 2.6, watercourses with catchment areas between 3-10km^2 are represented in both the river and surface water flood maps. For areas where future river flood map data is not available, if small watercourses of this catchment size and below are present, users are recommended to view the future surface water flood map to understand the potential future flood risk from small watercourses.

3.2 Single scenario mapped

The future flood maps published currently are each based on a single potential future scenario for time periods towards the end of this century.

The future river flood maps are based on projected changes for 2070-2099. The future coastal flood maps are based on projected changes for either the year 2080 or, for the Outer Hebrides and Loch Etive for 2100. The future surface water flood maps are based on projected changes for the 2070 time horizon, 2070 is the central year for the 2061-2080 time period, which is the latest period available in the UKCP Local projections used to develop the rainfall uplifts. Further details on the scenario used for each future flood map are contained in Sections 2.3, 2.4 and 2.5.

As outlined in section 2.2 these each represent one possible future. There are uncertainties regarding emissions, climate response and actions we take, which mean changes in flood risk could be smaller or larger than those mapped.

3.3 Other potential future changes not represented

The future flood maps take account of:

- Projected changes in sea level for the coastal flood map;
- Projected changes in peak river flows for the river flood map.
- Projected changes in peak rainfall intensity for the surface water flood map.

The future flood maps do not reflect other potential future changes which are likely to influence flood risk, which are subject to additional uncertainties, such as:

- Changes in river channel or floodplain geomorphology;
- Changes in land use;
- Population changes;
- Condition of defences or other infrastructure;
- Construction of new Flood Protection Schemes, bridges or culverts;
- Coastal erosion.
- Changes in capacity of drainage networks

River Channel Capacity & Tidal Boundaries

Within the river flood hazard mapping methodology, an assumption was made that channel capacity would remain equal to the pre-climate change median annual flow (QMED). Tidal boundaries within the river flood models used Mean High Water Springs (MHWS) levels for all scenarios and were not adjusted to account for climate change, so impacts in estuarine areas may be greater than those shown in either the river or the coastal flood hazard maps.

Coastal Erosion

Coastal erosion may also increase with rising sea levels. For more information on coastal erosion in Scotland see Dynamic Coast: Scotland's Coastal Change Assessment. For information, the Dynamic Coast project outputs include research outputs from an investigation of the likely impacts of climate change on future coastal erosion rates.

Wave Overtopping

The coastal flood hazard maps are generally based on still water design sea levels only, showing the risk from high tides and storm surge, but not from wave overtopping or wave run up, with the exception of Dundee, Eyemouth, Grangemouth, North East Scotland, the Orkney Islands, and the Outer Hebrides.

Wave heights at the coast are often limited by water depth, so sea level rise will increase wave height and overtopping rates at the coast. Therefore the impact of climate change on coastal flood hazard will likely be greater than that shown in areas of the future coastal flood map derived from the national coastal study which only considers projected changes in sea level.

In areas covered by the two regional coastal studies: North East Scotland and the Orkney Islands, and the Outer Hebrides, detailed inundation mapping has included consideration within the modelling of the risk from wave overtopping and wave runup. In these locations, changes in wave overtopping and wave runup with increased still water levels has been taken into account.

Climate change may also affect storminess and hence the height of waves away from the shore in deep water, however further research is needed to determine whether Scotland will become more or less stormy as the climate warms. Due to the uncertainty, changes in storminess have not been considered in developing the future coastal flood hazard maps, however it is expected that changes in storminess will have a much smaller effect on wave height at the coast, and hence wave overtopping and runup than sea level rise.

Changes in tidal range

Sea level rise may affect tidal range (the difference in height between high and low tides), which may also impact on flood risk. Further research is however needed to understand where in Scotland, sea level rise is likely to have an impact on tidal range and the resultant impact on flood risk. Potential changes in tidal range have therefore not been considered in the future coastal flood map scenario.

3.4 Representation of Flood Protection Schemes (FPS)

We have developed our maps in some locations by incorporating detailed modelling from studies for flood protection or alleviation schemes.

In some locations with FPS, flood map updates have been made to scenarios up to the present day medium likelihood (1 in 200 year), with the future medium likelihood under a climate change scenario (1 in 200 year plus climate change uplift) retaining outputs from SEPA's national river modelling. The future flood maps do not show any residual benefit from Flood Protection Schemes above their Standard of Protection in these locations.

Detail of the FPS locations in which the source of the modelling information differs between the present and future scenarios can be found in Table 5 (Appendix).

The future condition and future adaptation of defences has not been considered within the assessment.

4. Future Developments

Over time, as SEPA makes ongoing developments to the flood maps, updates to the future flood map datasets will be made and additional datasets released.

5. Data Availability

The published flood hazard maps as shown on the SEPA website are available for third party use under Open Government Licence. The datasets and supporting documentation are available for download on our Data Publication page. Please note that the availability of these datasets under Open Government Licence, does not provide access to the data or models underpinning the SEPA Flood Maps.

Appendix

Table 1: Summary of the percentage uplifts used to estimate the potential effect of climate change on river flood flows under a High emissions scenario for the 2080s 67th percentile from the Kay et al. 2011 study.

River basin region	Hydrometric Area (HA)	% uplift to peak flow from the 2080s High emissions 67th percentile from the CEH 2011 study
North Highland	HA001, HA002, HA003, HA004, HA005, HA006, HA007, HA008*	37
North East	HA009, HA010, HA011, HA012, HA013 (northern)	24
Tay	HA013 (southern), HA014, HA015, HA016	35
Forth	HA017, HA018, HA019, HA020, HA021 (coastal)	40
Tweed	HA021	33
Orkney and Shetland	HA107, HA108	41
West Highland	HA093, HA094, HA095, HA105, HA106	56
Argyll	HA087, HA088, HA089, HA090, HA091, HA092, HA104 (Kintyre), HA105	56
Clyde	HA082, HA083, HA084, HA085, HA086, HA104 (Arran)	44
Solway	HA077, HA078, HA079, HA080, HA081	44

*Note: For HA008, see **Table 2.**

Table 2: Future river flood map – locations where alternative uplifts have been used.

Hydrometric Area	Location	Note
HA007	Forres	Available scenario from the local study was a 15% uplift. Percentage uplift for the high emissions scenario for the 2080s 67th percentile from CEH study (Kay et al. 2011) would have been 37% for this Hydrometric Area.
HA008	Complete hydrometric area	HA008 was incorrectly identified as being in the North Highland river basin region rather than the North East region for application of the climate change uplifts during the National Fluvial modelling contract.
HA019	South Gyle	A number of map updates using surface water or Integrated Catchment Management (ICM) study results were carried out in small, urbanised catchments. In these locations the medium likelihood plus climate change scenario has been updated using the available scenario from these projects which was a 20% uplift in rainfall.
HA084	Yoker, Rutherglen, Glasgow (Merrylee), Paisley (Candren Burn area)	
HA085	Alexandria, Dumbarton.	
HA086	Greenock	
HA012	Aberdeen culverted watercourses	Available scenario from the Integrated Catchment Management study used a 20% uplift in rainfall and a river flow uplift of 24% (consistent with the North East Scotland region average from the CEH study (Kay et al. 2011))

Table 3: Future coastal flood map - locations where alternative uplifts have been used.

Geographical area	Note
Loch Etive	UKCP18 Sea Level Projections RCP8.5 50th percentile for 2100 relative sea level rise uplift used with updated design sea levels from the Coastal Flood Boundary Dataset (2018).
Eyemouth	In this location results were used from a SEPA model (2018) based on wave overtopping relationships within a Scottish Borders Council study (2013). Consideration of wave overtopping included. Uplift to sea levels applied is consistent with national coastal (UKCP09 2080 High emissions scenario 95th percentile). However available overtopping rates from the 2013 study were for a medium likelihood plus climate change period to 2060 (50yr period).
Dundee	Available scenario from the Dundee City Council model (2013) 1 in 10,000yr scenario used as a proxy for the medium likelihood plus climate change scenario. The uplift applied within this scenario was consistent with a UKCP18 RCP8.5 50th percentile relative sea level rise from 2008-2100.

Table 4: Mean percentage rainfall uplifts by river basin region used to estimate the potential effect of climate change on rainfall, by storm duration.

Based on analysis of the uplifts for the 2070 time horizon, central 50th percentile for the 100 year return period from the FUTURE-DRAINAGE study *(Chan, Dale, Fowler, & Kendon, 2021)*.

River basin region	1 hour storm duration Rainfall uplift (%)	6 hour storm duration Rainfall uplift (%)	12 hour storm duration Rainfall uplift (%)
Argyll	39	41	33
Clyde	35	37	29
Forth	34	34	26
North East Scotland	35	31	21
North Highland	38	35	25
Orkney and Shetland	40	35	25
Solway	33	34	26
Tay	35	33	25
Tweed	31	30	22
West Highland	40	42	33

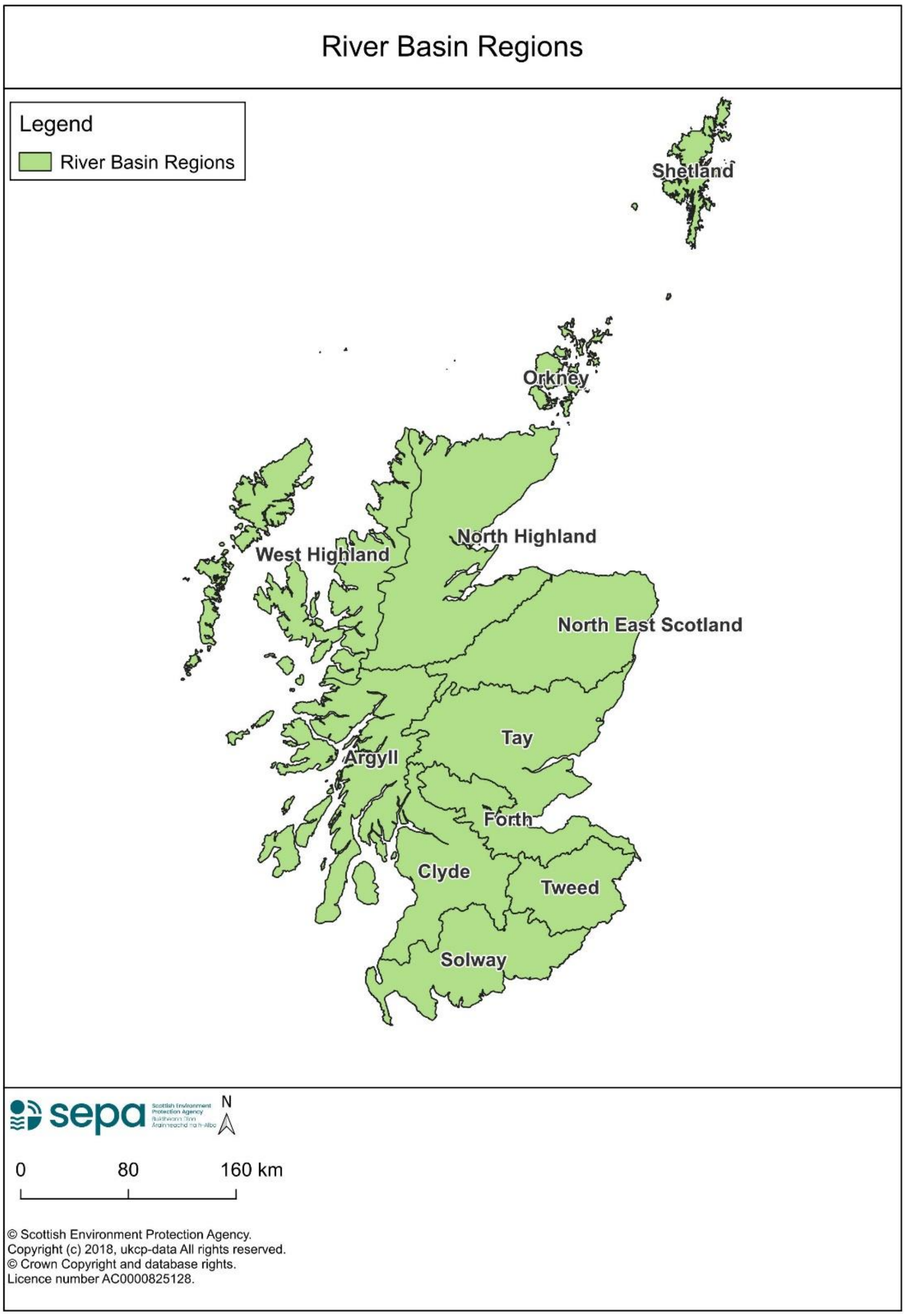

Figure 1 - River Basin Regions for the rainfall uplifts applied within the future surface water flood maps [14]

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[14] Note that there are some small differences between the UKCP18 river basin regions used with the rainfall uplifts, and the UKCP09 river basin regions used with peak flow uplifts for the future river flood maps.

Table 5: FPS locations where the modelling information source differs between the present day and future river medium likelihood scenarios.

Flood Map	Hydrometric Area	Location
River Flood Map	HA007	Elgin Nairn (not a formal FPS)
	HA018	Bridge of Allan
	HA019	Murrayfield, Water of Leith Niddre Burn, south of A7
	HA083	Kilbirnie

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