



Our ref: CL-03-16

Local Planning Authorities
Natural Resources Wales

23 August 2016

Dear Colleagues,

GUIDANCE ON CLIMATE CHANGE ALLOWANCES FOR PLANNING PURPOSES

Technical Advice Note 15: Development and Flood Risk (TAN 15) states consideration must be given to the impacts climate change may have on developments in areas at risk of flooding over the lifetime of the development. This is to ensure development does not take place where the risk of flooding is unacceptable either now or in the future, and development permitted is designed to withstand increasing flood risk caused by climate change.

Attached to this letter is guidance setting out how projected increases to peak river flows and sea levels, resulting from climate change, should be incorporated into flood consequence assessments (FCAs), for individual planning applications and for the purpose of development planning, in areas where there is a risk of flooding.

These climate projections should be incorporated into FCAs accompanying planning applications submitted from **1 December 2016**. The guidance will be updated when the next climate projections are produced.

Any queries on the climate projections or how to incorporate them within a Flood Consequence Assessment should be raised with Natural Resources Wales.

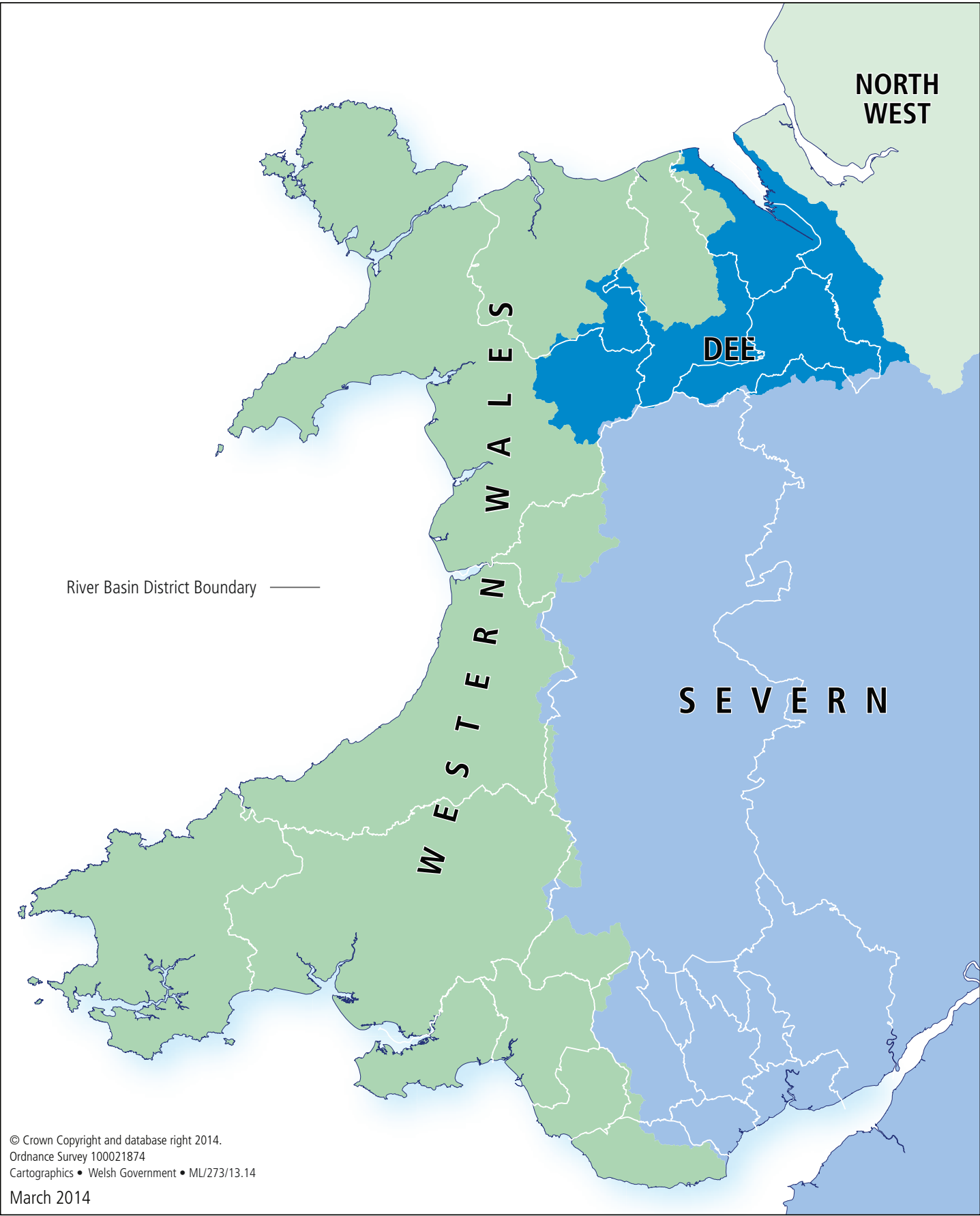
This letter and the guidance note are available to view on our website at <http://gov.wales/topics/planning/policy/policyclarificationletters/2016/cl-03-16-climate-change-allowances-for-planning-purposes/?lang=en> and will also be accessible from the TAN 15 webpage <http://gov.wales/topics/planning/policy/tans/tan15/?lang=en>

Yours sincerely,

Neil Hemington
Chief Planner, Welsh Government



River Basin Districts



Flood Consequence Assessments: Climate change allowances

Purpose of this Guidance

Flooding is already a serious risk to the people, economy and environment in Wales. Climate change is expected to increase this risk over the coming decades. The effects are well documented and include rising sea levels and more frequent periods of heavy rainfall increasing the risk of flooding.

When considering new development proposals, Technical Advice Note 15: Development and Flood Risk (TAN15) states that it is necessary to take account of the potential impact of climate change over the lifetime of development. Residential development is assumed to have a lifetime of 100 years while a lifetime of 75 years is assumed for non-residential developments. To ensure future development can provide a safe and secure living and /or working environment throughout its lifetime, national planning policy requires proposals in areas of high flood risk to be accompanied by an assessment of flooding consequences to and from the development, taking into account the impacts of climate change.

This guidance document sets out the climate change allowances that should be used in flood consequence assessments submitted in support of relevant planning applications, and to inform development plan allocations.

In line with TAN15, the climate change allowances have been informed by latest available information on climate change projections and different scenarios of carbon dioxide (CO₂) emissions to the atmosphere. Allowances are provided for different epochs (periods) of time over the next century. This guidance will be reviewed when more up-to-date climate change research is available.

The guidance set out in this document should be applied to planning applications (full, outline and reserved matters) submitted from 1 December 2016, and all development plans to be submitted to Welsh Government from 1 December 2016

What are Climate Change allowances?

Providing an allowance for the potential impacts of climate change when assessing future flood risk, allows for development proposals to incorporate design measures that help to manage that risk and improve resilience. This guidance provides detail on the allowances that should be applied for peak river flows in areas impacted by fluvial flooding, and sea level rise in those locations where there is a tidal (coastal) flood risk.

Peak river flow allowances

Improved understanding of how changes in our climate may influence river flood flows requires the use of regionalised data. The revised data reflect the different characteristics of river basin districts and how they may respond to climate change.

Table 1 indicates the anticipated increase in peak river flows for the [3 river basin districts](#) that cover Wales. The allowances are consistent with the A1B (medium)

emissions scenario derived from latest research projects and converted into regionalised data of climate change¹ on flood flows for the 2020s, 2050s and 2080s time-horizon, and for the B1 (low) and A1F1 (high) emissions scenarios for the 2080s time-horizon.

Estimates of peak flow increases are provided that represent future risk. The allowances are based on percentage increases of change from a 1961-1990 baseline and are provided for the:

- 10th percentile (lower end estimate)
- 50th percentile (change factor/central estimate)
- 90th percentile (upper end estimate).

Table 1: peak river flow allowances by river basin district (use 1961 to 1990 baseline²)

	Total potential change anticipated by the 2020s	Total potential change anticipated by the 2050s	Total potential change anticipated by the 2080s
Severn			
Upper end estimate	25%	40%	70%
Change factor /central estimate	10%	20%	25%
Lower end estimate	0%	5%	5%
West Wales			
Upper end estimate	25%	40%	75%
Change factor /central estimate	15%	25%	30%
Lower end estimate	5%	10%	15%
Dee			
Upper end estimate	20%	30%	45%
Change factor /central estimate	10%	15%	20%
Lower end estimate	5%	5%	5%

The projected peak river flow change is a range, with the highest estimate equally likely to occur as the lowest estimate. For this reason, **it is recommended that the central estimate, or change factor**, for the 2080s for the relevant river basin district should be used to assess the potential impact of climate change as part of a flood consequence assessment. If a figure other than the central estimate is used, applicants will be expected to provide full justification within the FCA.

¹ [UKCP09](#) data, EA/Defra research [FD2020](#) & [FD2648](#)

² Source: [UK Climate Projections 2009](#), published June 2009 by the UK Government Department for Environment, Food and Rural Affairs.

It is recommended that in addition to the change factor, an assessment of risk is made using the upper end estimate. The information derived from this assessment should be used to inform mitigation measures that help to ensure the long term resilience of the development. (Note: The upper end estimate may not be applicable to every site but will need to be considered depending upon the scale and nature of the site in question).

Sea level rise allowances

Projections of relative mean sea level rise for each epoch (period of time) is provided for the Welsh coastline in Table 2. These projections are consistent with the latest global predictions for sea level rise. The rate of change is projected to increase in each epoch.

Table 2: sea level allowance for each epoch in millimeters (mm) per year and cumulative sea level rise for each epoch (using sea levels published in 2008 as the baseline³).

Period	2009-2025	2026-2055	2056-2085	2086-2116	Cumulative rise to 2116
Annual change (mm/yr)	3.5	8.0	11.5	14.5	
Total increase	59.5 mm	240mm	345mm	449.5mm	1094mm

To calculate sea level, add the annual allowances for each year post-2008 (base sea level year) for the agreed lifetime of development. Table 3 and Table 4 demonstrate how to apply the calculation for 75 year and 100 year developments commencing in 2016.

Table 3: calculating sea level rise for a 75yr lifetime of development

Period	mm increase	Cumulative Rise
2009 - 2025	17 (years, inclusive) x 3.5mm	59.5 mm
2026 - 2055	30 x 8.0mm	240.0 mm
2056 - 2085	30 x 11.5mm	345.0 mm
2086 - 2091	6 x 14.5	87.0 mm
75 year lifetime	add	731.5 mm

Developments built in 2016 with a 75 year lifetime must be resilient to sea level rises until 2091. This table demonstrates that an allowance for an increase of 731.5mm should be made.

³ Source: adapted from [FCDPAG3 Economic Appraisal](#). Supplementary note to Operating authorities – Climate Change Impacts (Oct 2006) (figures calculated & published in 2008 - applicable for use from 1 Jan 2009).

Table 4: calculating sea level rise for a 100yr lifetime of development

Period	mm increase	Cumulative Rise
2009 – 2025	17 x 3.5mm	59.5 mm
2026 – 2055	30 x 8.0mm	240.0 mm
2056 - 2085	30 x 11.5mm	345.0 mm
2086-2116	31 x 14.5	449.5 mm
100 year lifetime	add	1094.00 mm

Developments built in 2016 with a 100 year lifetime must demonstrate resilience to sea level rises until 2116. This table shows that an allowance for an increase of 1094.mm should be made

When considering proposals with a lifetime of development beyond 2116, an additional allowance of 14.5mm should be added for each subsequent year.

Extreme wave height allowance

Climate change is expected to increase the frequency, duration and severity of storms. In some exposed coastal locations there may be a need to consider the impacts of extreme wave action. You should contact Natural Resources Wales for further information and advice on this requirement.

When to use High⁺⁺ allowances for peak river flow and mean sea level.

Climate change projections also provide allowances for a High⁺⁺ (H⁺⁺) scenario. H⁺⁺ provides an estimate of river flood flow change and sea level rise beyond the upper end estimates. It is not possible to say how likely the H⁺⁺ scenario is, however consideration of this scenario may be helpful for contingency planning and for those developments that are very sensitive to flood risk and have lifetimes beyond the end of the century. Examples include major infrastructure projects or developments that significantly change existing settlement patterns.

You should contact the Local Planning Authority to establish whether an assessment of the H⁺⁺ scenario is required as part of a flood consequence assessment. Guidance on H⁺⁺ allowances can be found in the Welsh Government document [“Adapting to Climate Change”](#).

Planning advice

Planning advice on matters relating to flood risk (from rivers and the sea) and how to assess future risk can be obtained from Natural Resources Wales. For advice on flood risk from local watercourses, surface, or groundwater, you should contact the relevant lead local flood authority.

Contact Information

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