Climate Change Risk Assessment Framework for PSBs

Purpose

***Section 38 of the Well-being of Future Generations Act requires Public Service Boards (PSBs) to take account of the latest UK Climate Change Risk Assessment (CCRA)* when preparing their Well-being Assessments.**

This framework has been created by NRW in collaboration with the Welsh Government and Public Health Wales, for use by PSB practitioners.

Our climate is changing. Over the coming years and decades, even in the best-case scenarios for emissions reduction, we will continue to see increasing impacts arising from climate change. We will see further sea level rise and coastal erosion, and increasing incidence of extreme weather events such as storms, flooding, heatwaves and drought, as well as changes arising from incremental average warming. We need to take steps to protect our health, businesses, infrastructure, public services, supply chains, natural environment, and ecosystems.

Analysis by NRW of well-being assessments published in 2022 concluded that the majority of well-being assessments did not demonstrate an adequate assessment of future climate risk in relation to well-being.

Without the undertaking of an adequate local assessment of climate risk, it will be difficult for PSBs to effectively prioritise their collective climate adaptation activity. This could mean the current and future well-being of communities is threatened by the predicted future climate.

This framework has been developed specifically to help PSBs consider the risks identified in the UK CCRA in a local context. Application of this framework will help PSBs become more informed about the threats that climate changes now and in the future pose to the well-being of communities in their locality.

Use of this framework should help inform the delivery of PSB's Wellbeing Plans as well as ensuring that other partnerships and public sector initiatives are giving due regard towards the multiple, diverse and cumulative impacts of a changing future climate on well-being in their locality.

Scope

Use of this framework should help PSB partnerships to achieve the following objectives:

- Consider, as far as possible, how and where economic, social, environmental and cultural well-being conditions are likely to be impacted by the changing climate now and in the future, using the CCRA3 Summary for Wales

- Consider the local, regional and national policy context for this work and the links between them

- Provide an evidence base for identification of a sub-set of priority risk areas for further analysis. These priority areas will be subject to further exploration and research, to inform the development and delivery of PSBs' well-being objectives.

This framework does…

- Help the PSB to develop the information and understanding required to assess the impact of a changing climate on the well-being of communities in the locality. It is based on the approach outlined by the UK Climate Impacts Programme (UKCIP) Adaptation Wizard Adaptation; Climate-ADAPT Adaptation Support Tool) and has been adapted to incorporate the PSB and well-being setting.

- Provide PSBs with a clear step by step process for assessing risk that once completed can serve to better inform local, regional and national adaptation approaches.

- Help PSBs to ensure that the process of undertaking a climate change risk assessment is a collaborative one, where understanding and expertise from a range of partners is included, and all partners are empowered to interpret climate risk in the context of well-being from the perspective of the community.

- Include information on relevant evidence and where to find it, how to interpret and prioritise risks, and advice on how to structure these conversations within the PSB.

- Take a place-based rather than a service-based approach to assessment of climate risk.

- Recognise that this is a challenging process and learning experience for the PSB.

- Recognise that those leading the process will need strong facilitation, engagement, and project management skills.

This framework does not…

- Provide specific advice on methods of facilitation or engagement in relation to the steps being undertaken.

- Represent a "one off" exercise for the PSB. Nor should it be considered in isolation from other local, regional and national climate risk related initiatives. Rather it is recommended that the process of assessing climate risk be inclusive of evidence from different sources, iterative and repeated when new and additional relevant information becomes available.

- Cover the development of a climate adaptation strategy or it's delivery; this would be the recommended next step on completion of a local CCRA.

- Provide a definitive list of evidence sources and tools. The evidence and tools available for assessing climate risk are multiple and various. It is important to remember that the end goal of this assessment is to assist partners in better understanding the risks and opportunities that a changing climate poses to the well-being of communities in the area. From this perspective this framework suggests that use of additional data and evidence in this instance is most effective when being used to add depth of understanding to decision-making and practitioner / officer experience rather than as a decision-making tool in and of itself.

- Cover disaster response planning.

National Context

- The climate in the UK (and Wales) is changing, and will continue to change in the coming decades, even as we work to reduce emissions and limit further global warming.
- The Climate Change Committee (CCC) publishes an independent assessment every 5 years, setting out the latest evidence on the risks and opportunities arising from climate change. The latest (third) assessment (CCRA3) was published in 2021.
- The Welsh Government's current national climate adaptation plan, Prosperity for All: A Climate Conscious Wales, was published in 2019.
- The CCRA3 shows that the levels of risk are increasing and further action is needed. Existing adaptation actions will not be sufficient to address future climate risks. The Welsh Government is due to publish a new national Climate Resilience Strategy in 2024, which will be informed by the CCRA3 and the CCC's Wales Climate Adaptation Progress Report, published in September 2023.
- The CCC advises the UK to adapt to a 2°C rise in temperatures, whilst assessing the risk at 4°C.

Background on the CCRA3 Summary for Wales

The third Independent Climate Change Risk Assessment (CCRA3) was produced by the UK Climate Change Committee (CCC) in 2021. This report provides the evidence base that underpins national adaptation programmes in England, Scotland, Wales and Northern Ireland.

Under the Climate Change Act (2008), the UK Government is required to carry out an assessment of the UK's risk from climate change (CCRA) every 5 years. The Act further stipulates that the Climate Change Committee (CCC) provide advice to UK Government six months before the CCRA is laid in Parliament.

CCRA3 comprises a Technical Report detailing the full analyses of 61 climate risks and opportunities identified for the UK. Further research reports supporting specific aspects of the Technical Report are also available, along with a range of Sector Briefings for specific areas. CCRA3 considers the climate projections through to 2080 for the UK as a whole, and for England, Scotland, Wales and Northern Ireland individually through the National Summaries, which provide more condensed and regionally-specific information.

When accessing these documents, please be advised that the Technical Report has been thoroughly peer reviewed, while the Summary for Wales has not been subject to the same review process. We would therefore advise those looking to explore climate risks in depth refer to the Technical Report and the sector briefings, referring to the Summary for Wales for an overview only.

The 61 risks identified within the CCRA3 (Summary for Wales) are organised under 5 themes. This framework helps PSBs to consider how these themes relate to the dimensions of well-being:

- Natural Environment and Natural Assets
- Infrastructure
- Health, Communities, and the Built Environment
- Business and Industry
- International Dimensions

The Welsh Government will be publishing a new National Climate Resilience Strategy in 2024, which should also help to inform PSBs in undertaking a climate adaptation strategy. This would be the most appropriate next step following completion of a local climate risk assessment.

The CCRA3 Technical Report lists 61 risks (and some opportunities) arising from climate change that could impact businesses, infrastructure, housing, natural environment, public health and international trade/relations. Some of these risks are new and did not appear in CCRA2. UK-wide, 54 of these risks have high urgency scores (More action needed or Further investigation, Fig. 3). These 61 risks are common across England, Scotland, Wales and Northern Ireland, although slight variation exists in respect of the urgency level assigned to them among the different national summaries, reflecting the specific circumstances of the constituent countries.

Of the 61 risks identified for Wales, **32 have the highest urgency score.** A further 20 have the second highest score (Further investigation). The level of current action is only considered appropriate (Watching brief) in respect of 4 of the risks listed. **26 risks have increased in terms of their 'urgency' score** since CCRA2.

Background on Climate Projections

The United Nations (UN) Paris Agreement 2015 says that we must limit global warming to well below 2°C, aiming for below 1.5°C above pre-industrial levels. Without global action to limit emissions, we would expect to exceed 4°C average global warming.

Following the 26th Conference of Parties of the UN Framework Convention on Climate Change (COP26), limiting warming to below 1.5°C is becoming increasingly unattainable without extreme measures. Current emission reduction pledges, made as part of nationally determined contributions, are likely to lead to warming above 2°C.

All projections for future global climate change, including those where we meet the goals of the Paris Agreement to limit warming to below 2 °C, show **continued increases in temperature until the middle of the 21st Century**. The Committee on Climate Change advises the UK to adapt to a 2°C rise in temperatures, whilst assessing the risk at 4°C.

The following are links to infographics about future climate scenarios, which may be helpful to communicate likely changes in weather patterns to PSB partners:

HEADLINE_FINDINGS (metoffice.gov.uk)

High-Impact-Weather-infographic-v14FINAL.png (1404×1903) (ukclimateresilience.org)

What will climate change look like in your area? - BBC News

The Met Office climate data portal (arcgis.com)

UK Climate Resilience outputs - Met Office

Step 1 – Plan your approach

The following tasks have been identified in relation to this step. Refer also to Step 1 in the associated workbook for completion.

Tasks:
- Establish governance
- Appoint a project lead
- Assemble the team
- Stakeholder mapping
- Get the message out
- Consider existing response measures in place and their effectiveness
- Plan evaluation
- Plan methodology

Skills required:
- Project management
- Stakeholder engagement

Establish governance

Buy-in from the PSB is essential.

Think about… Where does responsibility for this work sit? In an already established PSB sub-group? In a new task and finish group? In an external group or forum? Who is the PSB sponsor for this work? How and where will progress and outputs be reported?

Appoint a project lead

This work is potentially time consuming and should move at a steady pace once it has started. It is suggested that a project-based approach is used for this work.

Think about… Is the project lead someone from a PSB organisation? Does the individual have dedicated time to commit to this work? Would procurement of a short-term project manager be more suitable? Does the project lead have the right skills to facilitate a collaborative approach and manage a project?

Assemble the team

Remember that this is about well-being, so the team involved in this work should be a mix of climate risk technical specialists and well-being experts. You need a team that is manageable and representative (not everyone needs to be on the team!). Consider the 'Skills required' in the task box under each step, and ensure these skills are present within your team.

Think about… Who needs to be involved? Who doesn't need to be involved? Is the membership of the team set, or will it need to evolve over the course of the work? Do you need a Terms of Reference, or some shared principles to work by? This will ensure that all voices on the team are heard.

Complete: Workbook, Step 1, Table A4- E4

Stakeholder mapping

Take a moment to consider why you are collaborating on this work. The project team don't have all the knowledge and expertise needed to undertake a climate change risk assessment. So, who does?

Think about… Who are the organisations and individuals across different sectors who should be involved in the climate change risk assessment? Organise your stakeholders by well-being pillar. This will help you to identify potential gaps. A list of different stakeholder groups that you may wish to consider is included in Appendix A.

Think inside the box: Who from across PSB organisations do you need collaborate with? Who are the key partnerships and organisations in place that will have valuable insight? If you don't have all the answers, who else can you ask?

Think outside the box: Who could you collaborate with that might offer a new or different perspective? Do you need to establish a mechanism for stakeholders to self-identify as collaborators on this work?

*Think about…*who this is for: How are you going to involve communities and make sure that the lived experience of the people directly impacted by climate change risks is considered?

Complete: Workbook, Step 1, Table A15-D15

Get the message out

There are many mechanisms you can use to get the message out, invite collaboration and facilitate conversations to inform the undertaking of a climate change risk assessment.

Think about… Be clear with all stakeholders what this work is and what you are inviting them to collaborate on. Know your key messages and the mechanisms for engaging in this work that you are making stakeholders aware of. Do you want to offer a 'lighter touch' opportunity for input where stakeholders can provide information but are not part of a collaborative process, such as an online survey?

Consider existing risk assessments and adaptation strategies in place and their effectiveness

Understand what is already happening on climate risk and adaptation within PSB organisations. This would also be a useful point at which to connect with your Local Resilience Forum who can provide specific information about existing adaptation plans.

Think about… Where the constituent partnership bodies are in their own service-based adaptation journey. Consider the various national initiatives that could also provide meaningful insight into your understanding of risk across different sectors and how and when planned insights from other areas might feature in this framework now and in future iterations.

Plan evaluation

Monitoring, evaluation and learning need to be embedded in the early stages to be able to track what is working and what isn't, and to track effective use of resources. Consider how you will evaluate the effectiveness of this process in understanding climate risk and its impact on communities in your locality.

Promote effective learning - Effective learning has many aspects. These include: the mindset in the people involved; culture, knowledge management systems, opportunities for reflection in processes, tailoring and application of evidence for specific purposes. Looking outward for promising practices and reflection on internal practice can be useful, including the more tacit information that is often not written down and is generally passed through relationships.

Plan your methodology

One way to facilitate the conversations between stakeholders around reflecting on the current situation (see step 2) and looking forward (see step 3) is by hosting a workshop (or series of workshops). The following sections of this framework and the accompanying workbook set out the questions that stakeholders should collectively answer to undertake a climate change risks assessment. Getting together to plan these steps in a workshop setting or otherwise is a good first step. There will also be research and synthesis of evidence, and analysis of workshop outputs (see details in steps below). Set out clearly from the beginning, who will lead on each step.

Step 2 – Consider Past and Present Climate Impacts

The following tasks have been identified in relation to this step. Refer also to Step 2 in the associated workbook for completion.

Tasks
- Reflect on past weather events
- Identify relevant climate risks associated with past events

Skills required:
- Workshop facilitation
- Collaboration

We are already witnessing the impacts of a global average temperature rise of over 1°C compared to pre-industrial levels. Understanding how climate variables are already impacting the well-being of our communities can help us identify how ready we are to deal with the climate impacts of the future.

Reflect on past weather events

In a workshop setting, bring relevant stakeholders together to reflect on past climate events. Work with stakeholders to gather locally relevant information on current risk in your locality. Gather images and news stories from past events to aid discussions and feature in scene setting presentations.

Think about… What were the impacts of extreme weather events? What were the costs of those events? How did they impact wellbeing? How effectively were past events dealt with? Consider what went well and what did not go well? Explore your collective attitude to risk. Review how services were disrupted. What were the costs in terms of response and reputation? How were communities effected? Approach your Local Resilience Forum to input into this step.

Complete: Workbook Step 2, Column A-J

Identify relevant climate risks associated with past events

Consider which CCRA 3 risks are relevant to the past events identified (see CCRA risk list in the workbook).

Complete: Workbook Step 2, Column K-M

Step 3 – Looking ahead

The following tasks have been identified in relation to this step. Refer also to Step 3 in the associated workbook for completion.
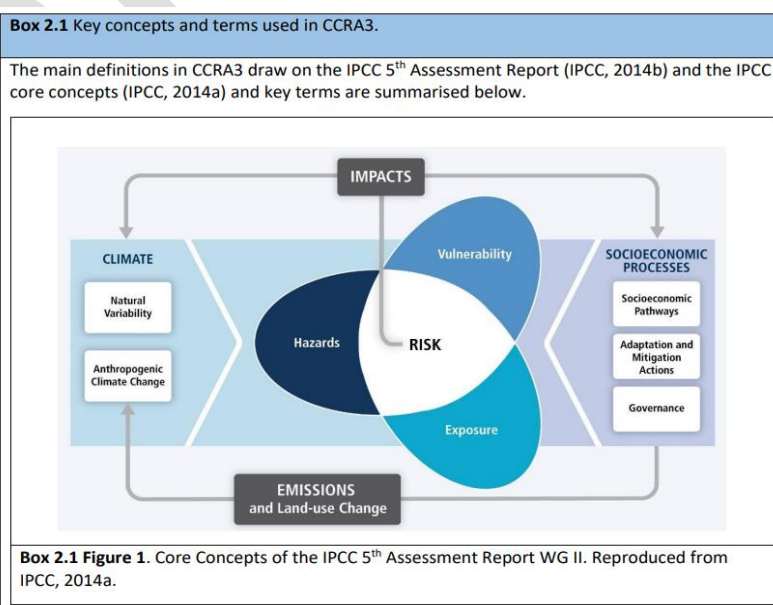

Tasks
- Understand how the Climate is expected to change in the future:
  - Review evidence of climate projections and how this will apply in your locality (hazard and exposure)
- Understand who, and what, is most vulnerable to climate change:
  - Review local evidence of vulnerability to future hazards (vulnerability)
- Identify how the changing climate is likely to impact future well-being in your locality
  - Systematically review the 61 risks from the CCRA 3 report. Identify risks to wellbeing within your locality (not all risks will apply). Assign scores for hazard, exposure, and vulnerability for each identified risk, within your locality.

Skills required:
- Confidence using data platforms and interpreting maps
- Evidence interpretation
- Workshop facilitation
- Collaboration

This step is about exploring climate risk to identify the degree of exposure locally and the extent of vulnerability to the risk of the components of the place that contribute to wellbeing. The diagram below, taken from the CCRA 3 report, explains key terms such as exposure and vulnerability in this context.

Box 2.1 Key concepts and terms used in CCRA3.

The main definitions in CCRA3 draw on the IPCC 5th Assessment Report (IPCC, 2014b) and the IPCC core concepts (IPCC, 2014a) and key terms are summarised below.

Box 2.1 Figure 1. Core Concepts of the IPCC 5th Assessment Report WG II. Reproduced from IPCC, 2014a.

Risk - The potential for adverse consequences where something of value is at stake and where the occurrence and degree of an outcome is uncertain. In the assessment of climate impacts, the term risk is often used to refer to the potential for adverse consequences of a climate-related hazard on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure. Risk results from the interaction of vulnerability (of the affected system), its exposure over time (to the hazard), as well as the (climate-related) hazard and the likelihood of its occurrence. Source IPCC SR1.5. Note that in CCRA3, the term risk is used for negative consequences (i.e. threats).

Opportunity - The potential for a beneficial consequence, as a result of a changing climate (the propensity to be beneficially affected). Source: CCRA3 Method Chapter Authors.

Exposure - The presence (of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets) in places and settings that could be adversely affected. IPCC, AR5.

Vulnerability - The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt. Source IPCC, AR5.

Hazard - The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. In the IPCC, hazard refers to climate-related physical events or trends. Source IPCC AR5.

Review evidence of climate projections

To gain a better understanding of what climate change will look like in your area, review existing evidence of projected climate change scenarios (hazards) using UK Climate Projections 2018 (UKCP18). These are the sixth generation and most recent set of climate change projections specific to the UK (the last was UKCP09), led by the UK Met Office.

This should include reviewing **local** evidence of:

- Flooding
- Coastal erosion
- Sea level rise
- Heat effect, both average temperatures and extreme temperatures e.g periods of extreme heat
- Drought
- Wildfire
- Storms

See Appendix B for examples of where to find this evidence and Appendix C for existing climate toolkits. Ideally this evidence should be presented in a format where these data sets can be explored on a local scale.

Review local evidence of vulnerability to climate projections

To gain a better understanding of who and what is most vulnerable to the impacts of climate change within your locality, consider the 10 vulnerable population groups identified in the Climate Change Health Impact Assessment, and where these groups are in your area, as well as other information that may be available, such as in relation to local businesses / industries and natural resources.

PSB Wellbeing Assessments and RPB Population Needs Assessments are good sources of vulnerability data (see links in Appendix B). There are also vulnerability layers on the Climate Just Tool.

Think about… whether there are any evidence gaps in your area. Work with your regional partnership board to make sure you get an accurate understanding of vulnerability and the threats to well-being identified to particular groups in your locality.

Systematically review climate risks

Systematically review the risks identified in the CCRA Technical report to identify which risks are relevant to your local area. While it is anticipated that most will apply to some extent, we recommend shortlisting these risks under categories, and focusing only on those most relevant to your PSB.

Organise your risks according to the relevant wellbeing dimension, as identified by the key in your workbook.

In a workshop setting with representative partners, discuss your **short list** of risks in detail. Consider the evidence available for the 4 determinants of each risk: hazard, exposure, vulnerability, and response (see below).

How to assess risk

*"**Climate risk** is about more than just the climate hazard alone. Risk is a combination of hazard, exposure, and vulnerability, so it is critical that information about the weather and climate is evaluated in the context of the lives and livelihoods of the populations affected".* UK Met Office[1]

Risk in this context is the potential for adverse consequences of climate-related hazard on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure. Risk results from the interaction of vulnerability (of the affected system), its exposure over time (to the hazard), as well as the (climate-related) hazard and the likelihood of its occurrence. Source IPCC SR1.5.

1) **Hazard:** This is the weather and climate events which may have adverse effects. The occurrence, duration, and intensity of which may change due to climate change. For example, heat waves.

2) **Exposure:** This is where the hazards is, in relation to people, property, infrastructure, etc, that may be impacted by it. For example, the spatial extent of a heat wave in relation to the location of people, buildings and local infrastructure that might be affected by it.

3) **Vulnerability:** This is the likelihood of the exposed people, property and other economic resources suffering adverse effects from the hazard. Factors such as population demographics, ecosystem resilience; economic resilience etc all affect vulnerability. For example, elderly people and the very young are vulnerable to being affected by heat waves. Vulnerability is in turn affected by the capacity of people and places to adapt or respond to the hazard.

4) **Response**: This is the climate adaptation measures that are already in place. For example, air conditioning units alleviate the negative impacts of a heat wave.

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[1] Climate risk reports - Met Office

Think about… consider how different drivers within and between the determinants of each risk might interact and how different risks may interact.

Complete: Workbook Step 3, Columns A-R

Step 4 – Risk Prioritisation

Tasks
- Prioritise risks
- Consider what is within the influence of the PSB

Skills required:
- Evidence interpretation
- Workshop facilitation
- Collaboration

Prioritise risks

Prioritise the identified risks by looking back at your workbook in Step 3. Identify the specific communities and population groups vulnerable to those risks and use this information to pinpoint spatial hotspots, priority settings (such as schools and care homes), and population groups (such as older adults) where adaptation should be prioritised in the local area.

Consider what is within the influence of the PSB

Some of the risks identified will require adaption actions that sit outside of the control of the PSB. Consider how these risks could be addressed outside of the PSB, and where your assessment could be shared. Consider which risks would benefit from a collaborative approach in a future adaptation strategy (the next recommended step).

Step 5 – Iteration

Tasks
- Identify triggers for refreshing the local CCRA
- Monitoring

Skills required:
- Project management

Identify triggers for refreshing the CCRA

This should be an iterative and adaptive process. Consider what might trigger the need for the assessment to be repeated. For example, after revision of the National Adaptation Plan, or UK Climate Change Risk Assessment. It may be when new data becomes available, if a new risk emerges, prior to decision making, ahead of the next wellbeing plan, etc. This may not be necessary for the full lists of risks.

Monitoring

Identify how identified triggers will be monitored, and who's responsibility this will be.

Next Steps

Climate Adaptation strategy

Consider the role of the PSB in helping to address risks in the local area. The local climate risk assessment should inform an adaptation strategy for the PSB.

Building adaptive capacity and capability amongst PSB partners

PSBs may require support to develop a better understanding of **local climate risk** within their area. The following bullets are designed to support the PSB to collectively consider its own role in the wider context of climate adaptation as the partnership increases its awareness of activity in this area. PSBs are advised to consider the following:

- Understand the PSB's sphere of influence in this area. What is within its gift to change? How can it add value?

- Opportunities to influence systems' change and transformation such as the PSBs' influence on other strategic partnerships operating in the region (e.g. Corporate Joint Committees, Regional Partnership Boards, Local Resilience Fora, Local Government Climate Strategy Panel) should be identified and acted on to avoid duplication.

- How the five ways of working can support climate change adaptation activity, for example, by developing a long-term shared vision, involvement of communities, and prevention of adverse effects.

- Prioritise the risks relevant to the local area, and decide collectively which PSB partner should lead on each risk.

- Consider whether existing local policy, practice and resource allocation will be enough to mitigate long term climate change impact. This activity should include a consideration of what existing activity needs to stop, change, or be renewed.

- Develop a mechanism for engagement / involvement with communities most at risk.

- Identify where and how public sector assets could be repurposed to increase resilience / mitigation.

- Identify how a sustainable long term investment stream could be achieved to enhance community resilience via mutual aid groups and locally-led adaptation actions and projects.

- Continue to develop evidence and insights on interactions between climate risks and wider social, economic, and natural systems.

- Monitor and evaluate progress and take an adaptive management approach to continually improve performance.

Appendices

A. Stakeholder groups to consider

NB. This is not an exhaustive list

- Elected Members
- Local Resilience Forum
- Regional Partnership Board
- Local Environmental Health Practitioners
- Local Planning Officers
- Local County Voluntary Council
- HM Prison Service
- Higher Education institutions
- Further Education institutions
- Homelessness agencies
- Mental health agencies
- Asylum and Refugee agencies
- Gypsy, Roma, and Traveller agencies
- Age Cymru
- Youth Services
- Commissioning teams for residential care
- Cluster leads for GP surgeries
- Voluntary & Community Sector Emergencies Partnership
- Community Safety Partnership
- Children's Safeguarding Partnership
- Tenants' & Residents' Associations

B. Where to find evidence

i) River and Marine Data

Information/Data	Brief description (what the data/evidence includes)	National/Regional information	Externally available/published?
Flood risk data	Contains national Flood risk assessment data maps and national coastal erosion risk maps (up to 2105) (Tidal flood risk mapping from the latest Flood Risk Assessment Wales modelling).	National	Internally on X-drive. Externally on the NRW website & data is available to view/download at DataMapWales here.
Coastal erosion predictions/risk maps	Maps showing coastal erosion risk (National Coastal Erosion Risk Management data – predictions of erosion over the next 100	National	Map layers are available here and data is available to download on DataMapWales here.

	years under 2 scenarios: no active intervention and with Shoreline Management Plan policies implemented).		
Communities at Risk Register	Data that quantifies the level and distribution of flood risk across Wales.	National	Published externally here (does not currently contain Climate Change impacts: discussions ongoing with Welsh Government).
Shoreline Management Plan policy data	Shoreline Management Plans present preferred sustainable coastal management policies from 2005 – 2105 for the Welsh coastline.	National	Information available on the NRW website here. Map layers are available here and data is available to download on DataMapWales here.
Coastal Squeeze impacts in terms of area and receptors (Annex 1 Intertidal Features)	Contains information on climate change (sea- level rise) associated coastal squeeze on the designated features of the National Site Network and MPA-directly related to coastal assets associated with privately owned tidal flood risk management banks and bunds (e.g protecting agricultural land) in areas outside of hold the line policy i.e. within managed realignment and no-active-intervention policy areas.	National (Wales) information on the impact of this is defined in the IROPI [2]Statements of Case for the Shoreline Management Plans (SMP2s) and the Dee and Severn Estuary Flood Risk Management Strategies (to note: the impact assessment applies old generation estimates of sea level rise).	IROPI cases are open to public scrutiny through FOI.
Coastal Squeeze impacts in terms of area and receptors (Annex 1 Intertidal Features)	Climate change (sea-level rise) associated coastal squeeze on the designated features of the National Site Network and MPA related to coastal assets associated with tidal flood risk management and coastal erosion risk management (predominately but not exclusively with SMP2 hold the line policy areas).	Initial estimates for the Llyn Peninsula and Sarnau SAC evaluated by NRW. Project underway to evaluate National scale to be completed by 2025.	Wales-wide outputs will be available on project completion.
Land use change through ground sea water intrusion and	Rising sea levels resulting from climate change will impact	UKCP18 tidal estimates, NRW Flood Maps and	Report published here.

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[2] IROPI - imperative reasons of overriding public interest

associated salt blight	agricultural land through both tidal inundation and ground water impacts resulting in salt blight.	local coastal adaptation Project assessments.	
Impact of landfill sites at the coast on Marine Protected Area features in Wales	A report which investigates the potential pressures caused by landfill sites at the coast, including looking into the future across the 3 Shoreline Management Plan epochs, taking into consideration coastal flood risk and coastal erosion risk.	National- – with an emphasis on pressures to Marine Protected Area features (including saltmarsh and sand dune).	Published report is available here. The GIS data and supporting spreadsheets are available on NRW's GIS X Drive.
SoNaRR: Future trends in coastal margin habitats	Provides summary details of impacts of changing weather patterns & sea-level rise on coastal margin ecosystems.	National	Coastal chapters of SoNaRR are available here.
Coastal access & adaptation	A report which looks at how coastal access (public rights of way & Wales Coastal Path) may be affected by coastal adaptation measures associated with Shoreline Management Plans.	Regional information	Report is available here.
Coastal squeeze impacts on MPA features	A project is underway to understand the likely scale of deterioration of MPA features due to coastal squeeze which will look at the scale, extent and location of habitat loss that is likely to occur.	National	Results expected spring 2024 and could be shared with partners once available. Project completion spring 2025.

ii)   *Socio-Economic Data*

PSB Wellbeing Assessments

Cardiff Local Well-being Assessment (cardiff.gov.uk)
Ceredigion Ceredigion Assessment of Local Well-being - Ceredigion County Council
Conwy & Denbighshire Well-being Assessment (conwyanddenbighshirelsb.org.uk)
Cwm Taff Morgannwg Cwm Taf Morgannwg Well-being Assessment - Cwm Taf Morgannwg (ourcwmtaf.wales)
Flintshire An Assessment of Well-being in Flintshire 2022
Gwent Gwent Well-being Assessment - Gwent Public Services Board Gwent Public Services Board (gwentpsb.org)
Gwynedd & Mon Gwynedd & Anglesey Well-Being | Well-Being Assessment (llesiantgwyneddamon.org)
Neath Port Talbot nptwellbeing.wales – Well-Being-Assesment
Pembrokeshire Well-being Assessment - Pembrokeshire County Council

Powys Full Well-being assessment analysis - Powys County Council
Swansea Assessment of local well-being 2022 - Swansea
Vale of Glamorgan Well-being Assessment 2022 (valepsb.wales)
Wrexham Our Well-being Plan - Wrexham PSB

RPB Population Needs Assessments

Cardiff and Vale of Glamorgan Population Needs Assessment 2022

Cwm Taf Morgannwg population needs assessment

Gwent Population Needs Assessment

Population Assessment 2022 - West Wales Care Partnership (wwcp-data.org.uk)

North Wales Population Needs Assessment (northwalescollaborative.wales)

West Glamorgan Population Needs Assessment

Powys Population Needs Assessment

C. Existing toolkits

Credit: PHW AND Urban Habitats.

What is included in existing toolkits?
Adaptation toolkits differ in their content, data used and their output. The below table suggests topics/ domains of inclusion you would expect to find within a 'good' adaptation toolkit, assessing their inclusion within the existing toolkits:

Domain	Toolkit			
	LCAT	OpenCLIM	UK Heat stress	Climate Just
Climate change				
Weather	*	*		
Extremes		*		*
Flooding		*		*
Heat stress		*	*	*
Seasonal data (i.e., Winter and Summer)	*			
Model data				
Identifies model used		*	*	*
Uses a Regional Climate Model (RCM)	*	*	*	*
Uses Shared Socio-Economic Pathways (SSPs)		*	*	
Refers to uncertainty of data		*		*
Refers to alternative warming scenarios and emissions pathways (Representative Concentration Pathways, RCPs)		*	*	*
Adaptation				
Mentions Adaptation	*	*		*
Refers to alternative types of adaptation		*		

States its role in supporting local authority planning	*	*		*
Outcomes of tool				
Produces a map			*	*
Produces a report	*			*
Visual tool	*		*	*
Downloadable data		*		*
Ease of use				
Provides a guide/ step by step process on how to use tool	*		*	*
Provides a video guide	*	*	*	*
Provides resources on key terms, information and data used within the tool		*		*
Provides extra resources	*	*		*

Useful resources

CCC's third UK Climate Risk Assessment reports 2021 (CCRA3)

Current national climate adaptation plan - Prosperity for All: A Climate Conscious Wales

CCC report Adapting to Climate Change, Progress in Wales 2023

National Trust Climate Hazards (arcgis.com)

Natural Resources Wales / Peatland Data Portal Map Layers

Aderyn :: Home (lercwales.org.uk)

5.1 Designing an effective adaptation action plan — English (europa.eu)

Future Wales: the national plan 2040 | GOV.WALES