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It may be sensible to keep an accurate record of your options and decisions, so you can go back to the assumptions made if the adaptation choice is not working. The changes in the weather and climate can be recorded to give an accurate picture of any changes. Keep informed of changing predictions for climate change and monitor what happens to your development over the years. Different results to what was expected may suggest it would be sensible to go through the steps again to see what needs to, or could, be modified.

# Appendix E: Climate-smart planning cycle

Climate change predictions are based on what *could* happen, rather than knowing precisely what *will* happen. As such, do you want to consider the most likely changes, or be prepared for the most extreme conditions just in case? You probably need to understand the lifetime of your development and how things could change over that timescale.



Make the choice about which option to follow. This may be immediate action, or you can identify ‘triggers’ as to when you are going to act (e.g. you are willing to live with the driveway being flooded a few times a year at very high tides, but when it’s happening monthly it will be time to act).

Are there actions you can implement now that would help you cope with a new climate regime? Can you alter construction or management choices that minimise any risks? Can what you construct be altered easily in the future if predictions and/or on site experience is worse than you planned for? Are there different technologies that could be applied to lessen risks? If no options seem possible, you may wish to go back through the steps and modify your goals or objectives.

What do you want to achieve? What will you have at the end of the timescale being considered? For example, how often will you use the development and at what time of year? Perhaps the flood impacts will be negligible or not manifesting themselves in the short-term. Be clear about what you would prefer to have in the future – for example, a development that never floods or one that floods a few times a year.

Taking the preferred projections (See the Met Office/UKCIP09 projections website for details) consider what the climate differences are likely to be and how they may impact on the proposed development. List, and possibly rank, the likely things that could create an adverse impact, as well as any opportunities a changing climate might offer for your development and how it is used.

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# Appendix F: Climate-smart checklist

How to complete the checklist

Consider the development as a whole and in terms of its constituent parts including groundworks, construction (low and high level), height of items, water flow on and off the site, and proximity to external risk factors (including sea, rivers, streams, ditches, trees, other construction).

We suggest you initially consider your development against current average weather conditions. Then consider recent weather extremes, and what those impacts might do to your development. For example, could it cope with sudden, very intense rain showers? Would a week of mid 300C temperatures melt anything?

You should then consider future climate projections (relevant to how long you think your development will last). As these are only projections, first consider how likely things are to happen, and at what rate (for example, if you think greenhouse gas emissions will decline quickly, the chances of the highest level projections being reached are slim, and vice versa).

You should also consider what level of risk you could live with (for example, if you think that tolerating significant fluctuations in temperature is an unacceptable risk, you may choose to incorporate certain adaptive features in your development). You may also want to think about potential future occupiers and how attractive ‘climate-smart’ features would be to them.

Looking to the future will help you consider whether your development needs to be more resilient or adapted to cope more effectively with climate impacts (for example, moving to a different part of the site where there will be more shade for the house, or tree planting to provide shade).

It is particularly important to consider the potential changes in extreme weather conditions. Projections are that such extremes may become more frequent, as well as reaching new highs or lows, such as more intense bursts of rainfall due to increased thunderstorms.

Additional information and advice

To support this checklist, the Broads Authority has a range of additional guidance on getting the best from your development proposals:

1. **Sustainable Development Guide**[[1]](#footnote-1)**.** This gives comprehensive advice, across a range of development types, on incorporating a sustainable approach. The Guide will be reviewed every three years.
2. **Broads' 0Community advice**[[2]](#footnote-2)**:** Produced by the Broads Climate Partnership, this gives more detailed suggestions for farmers, businesses, and local communities on adapting to climate change.
3. **Broads Climate Adaptation Plan**[[3]](#footnote-3): Produced in 2015, the Plan introduces current thinking about climate adaptation for the Broads, and sets out the ‘climate-smart’ approach.

Explanatory notes

Remember that, just as now, there will be chances of extremes at both ends of the weather spectrum (such as heavy snow fall, winter ‘heatwaves’, freak hailstorms, flash flooding and extreme heat), for which you should be making allowances according to your assessment of risk.

**Sea level rise:** Current projections for sea level rise range from 37cm to over 1m by the end of the 21st century. A rising sea increases the threat of over-topping defences or stopping heavy rainfall from running out to sea. It is also likely to mean salty water is pushed further up the rivers (altering wildlife distribution and perhaps increasing corrosion) and could mean air draft under bridges at high tide is likely to be reduced. Higher initial levels could also worsen impacts when surge conditions (strong winds and depressions) combine to push water inland.

**Surface water flooding:** With more impermeable surfaces due to development, heavy rainfall can overwhelm drains and ditches and give rise to a higher threat of surface water flooding. By keeping land permeable to rainfall, having overflow areas that can hold excess water, or incorporating flood barriers into the building, the risk can be lowered.

**Increased water temperature in watercourses:** Increased temperatures alongside high nutrients may increase the probability of blue-green algal blooms, which can be toxic, or excessive aquatic vegetation growth. The increased river/lake temperature may also affect the overall distribution of species, with knock on effects such as on recreation interests.

**Heatwaves:** Periods of high temperature caused by trapping energy in the atmosphere, along with more cloud free days, could see the prolonged periods of sunshine melting certain materials or causing human health issues. Developing ways to shade living and working spaces (such as window shutters or tree planting) may provide improved tolerance.

**Drought**: Longer periods of no rainfall could put stress on water levels. This may affect the environment and wildlife (such as low flow in rivers or ponds drying out), and could also decrease the amount available for people to use.

Next steps

According to your acceptance of risk, you may wish to make more a detailed exploration and assessment when your self-assessment reaches a certain impact level (e.g. for all ‘significant’ and above impacts).

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| --- | --- | --- |
| **What will happen to the development and/or the users or occupiers if there is…?** | **Impact level.** | **Why do you think this?**  |
| **Put an x to indicate impact.** | **What can you do to reduce this impact level? How have you designed the development to address this?** |
| **Nil** | **Small** | **Medium** | **Significant** | **Extreme** |
| **Higher summer temperatures (average and maximum)** |   |   |   |   |   |   |
| **Longer periods of drought during the summer** |   |   |   |   |   |   |
| **Longer periods of cloud free days** |   |   |   |   |   |   |
| **Water (river, stream and lake) temperatures increased through year especially the summer** |   |   |   |   |   |   |
| **Rainfall coming in more intense bursts** | **Greater potential for surface water flooding** |   |   |   |   |   |   |
| **More potential for higher ditch, stream and river levels** |   |   |   |   |   |   |
| **Fewer frosty days** |   |   |   |   |   |   |
| **More frequent storms – the effect of rain and wind** |   |   |   |   |   |   |
| **More extreme / intense storms – the effect of rain and wind** |   |   |   |   |   |   |
|   |   |   |   |   |   |
| **Rise in sea level** |   |   |   |   |   |   |
| **Increase in salinity in the rivers** |   |   |   |   |   |   |
| **Surge conditions in the North Sea** |   |   |   |   |   |   |

1. Sustainability Guide: [www.broads-authority.gov.uk/\_\_data/assets/pdf\_file/0015/410307/SustainabilityGuide.pdf](http://www.broads-authority.gov.uk/__data/assets/pdf_file/0015/410307/SustainabilityGuide.pdf) [↑](#footnote-ref-1)
2. Broads’ Community: [www.broads-authority.gov.uk/looking-after/projects/broads-community](http://www.broads-authority.gov.uk/looking-after/projects/broads-community) [↑](#footnote-ref-2)
3. Climate Change Adaptation Plan: [www.broads-authority.gov.uk/looking-after/climate-change](http://www.broads-authority.gov.uk/looking-after/climate-change) [↑](#footnote-ref-3)