

# OUR HERITAGE AND THE CHANGING CLIMATE

SOUTH  
EAST



Severe storms and rainfall occurred across much of Kent and East Sussex in October 2000, causing wide spread damage at sites like Bayham Abbey, Bodiam Castle and over 800 properties in the centre of historic Lewes.

## Climate change is the defining issue of our time

A wealth of research on the topic has been undertaken, but as yet relatively little of it is dedicated to exploring how climate change is impacting on the historic environment. The key question is how all stewards of the historic environment can and should respond to the challenges we face. The South East Historic Environment Forum (SE HEF) has produced this document as an adjunct to its annual *Heritage Counts* monitoring report in order to highlight the main issues and signpost people to the innovative and appropriate solutions that are available. We hope this document will both inspire and encourage anyone involved in managing the historic environment in the region.

### THE IMPACTS OF CLIMATE CHANGE ON THE HISTORIC ENVIRONMENT IN THE SOUTH EAST

The evidence of a changing climate on our environment is already apparent, nowhere more markedly than in the South East. As a wealthy region with a large population, the South East has a high ecological footprint and consequently the predictions for this region are the most severe in the country. Higher temperatures, rising levels and rates of precipitation, increased frequency of storms, and the rise in sea levels are just some of the more obvious changes we are seeing. **But what are the tangible consequences of these changes on traditional buildings, archaeological sites and historic towns and landscapes?**

- ▶ Increased occurrence of **flooding** will affect historic buildings and areas, such as was seen at Lewes in 2000 and Oxford in 2007, where entire townscapes featuring many traditional and listed buildings were affected, with huge conservation and financial implications.
- ▶ **Rainwater penetration** into historic buildings that were not designed to cope with sudden heavy downpours affects both the historic fabric of a building and its contents, as was seen at Greys Court in Oxfordshire (see inside).
- ▶ **Extreme storm conditions** can have a major impact on historic landscapes and parks, where damage has included, for example, loss of veteran trees at Bodiam Castle in 2000.
- ▶ Warmer climates are increasing the occurrence of **pests and fungal diseases** which can be detrimental to garden plant species, building fabric, interior furnishings and museum collections. Other impacts in historic parks and gardens, such as longer seasons, mean sites such as Sheffield Park Gardens are now managing extended and unpredictable growing and flowering periods throughout the year.
- ▶ Sea level rise and **coastal erosion** is already affecting places in the South East. For example, at Birling Gap in East Sussex the cliffs are eroding to such an extent that the removal of some nineteenth century fisherman's cottages in a row perilously close to the cliff edge has been necessary.

The long-term impacts on historic fabric will be determined very much by how owners and managers respond through their roles in planning and managing the historic environment. Unless we are careful, some of the responses could cause irreversible damage to the historic environment. For example, structural alterations to buildings, changes in land use and new coastal defences can do as much harm as good unless the consequences are thoroughly thought through. What is certain is that responding to climate change will test traditional conservation philosophy for all those involved. Adaptation will be an integral part of conservation.

# What we can do about climate change and its impact on the historic environment

The heritage sector in the South East wants to lead by example on the climate change agenda. The case studies on the following pages demonstrate ways in which historic buildings and landscapes adapted and impacts on our historic environment are being minimised, so that our heritage retains its values. These changes will not all occur overnight, so our responses can be measured and affordable. Rapid and drastic action will only be needed in response to unforeseen disasters. The examples demonstrate what can be achieved at heritage sites at a local level. Above all, they highlight that:

- solutions are seldom simple;
- they need proper planning;
- prioritising the solutions is key to ensuring the best use of available funds;
- often, behavioural change can reduce damage and energy consumption.

## Adapting historic buildings to cope better with extreme weather conditions

GREYS COURT, OXFORDSHIRE

No 1

The National Trust has undertaken groundbreaking work at Greys Court through a £2.5m project to conserve and re-service the main manor house.

A major quinquennial study of the property was undertaken in 2004/05 in order to understand all the management and conservation issues associated with the estate. The mansion house had been suffering in particular from rain water penetration. Insulating the roof and redesigning the rainwater goods were identified as key priorities.

Greys Court is a complicated building and the Trust recognised that collecting a full evidence base would be vital if the necessary repairs and alterations were to be carried out effectively. Heat loss, energy usage and humidity were all monitored for a full year to enable the most appropriate and least intrusive solutions to be designed.

Phase I of the project addressed the external elements of the building to make it watertight. The original parapet gutters were enlarged and were fitted with simple and sympathetically designed modifications to allow the overflow mechanisms to cope with greater volumes of water; whilst keeping run off away from the house itself. Phase II of the project is addressing the internal repairs required, and how the building will be heated.

The works carried out at Greys Court remain a rare example of proactive adaptation of a building in the face of a changing climate. Such a programme would not be affordable for many managers of properties in a similar condition, though valuable lessons can be derived from the processes used. Most innovative was the extensive monitoring undertaken before designing the modifications. Throughout the history of any large house, modifications will have been made and compromises reached. Maintaining the historic integrity of a building is possible with careful thought.

The staff at Greys Court have ensured their visitors and the local community have been fully engaged with the project by designing a visitor site hut. This facility consists of interpretation panels that explain the entire project whilst also relating the works to the kinds of issues and improvements that could be considered for visitor's own homes, thereby promoting the message that we are all involved in facing the challenges of climate change.

## Green energy generation

ELVENDON PRIORY, OXFORDSHIRE  
AND STANSTED PARK, WEST SUSSEX

No 2 & 3

Heating of houses, particularly large historic estates, has become increasingly expensive in recent years. Elvendon Priory (Grade II) and Stansted Park (Grade II\*) are just two examples of such estates that have moved to bio-fuel heating systems to provide energy throughout their estates. Stansted House's existing oil fired system gave the estate a carbon footprint of 250 tonnes per annum. Their new boiler system will allow them to burn chestnut coppice, a commodity widely available on the estate, which was at risk of growing rank, to produce energy and reducing carbon emissions significantly. The whole of the tree is used in the process and the small amount of ash waste produced can be used for gardening on the estate, making the entire system environmentally sustainable. The scheme was proved viable at 32p per litre of heating oil; with current prices in excess of 50p per litre, it will also prove to be sound economically. This has already been shown at Elvendon. Their wood-chip boiler system was installed in 1998 and is fed on woodland waste from the surrounding estate. In 1998 the estate spent £2k per month on gas. Within three years of completion, the substantial outlay for the new system had been recovered. Both projects are excellent examples of how the historic link between a country house and its surrounding landscape can be enhanced in a contemporary way. With the introduction of very efficient insulated piping boiler units, their attendant fuel stores can now be located away from the main buildings and do not need to impact adversely on the historic building.

2 Stansted House.

3 The boiler hut and associated buildings next to the main house at Elvendon.

▼ The visitor site hut and interpretation on the re-servicing project at Greys Court.





## Green energy generation

ST NICHOLAS STROOD, ROCHESTER, KENT

No 4

This former parish church, listed Grade I, in a conservation area and adjacent to the magnificent Rochester Cathedral, is now the administrative office of the Diocese of Rochester. During its conversion into offices, natural and carbon-neutral energy supplies were sourced and modifications were undertaken to ensure the building was more energy efficient. A small pellet boiler was installed in the existing plant room to generate heat; solar photovoltaic panels were sensitively sited behind the parapet roof line for electricity generation (completely invisible from ground level) and a new internal shell was constructed for the building to provide it with a secondary envelope. All of these installations are completely reversible. The installations demonstrate that renewable technologies can work in harmony with historic buildings without diminishing aesthetic values. The scheme has been so successful for the Diocese that they are able to sell excess electricity back to the national grid.

## Reducing carbon footprint

THE BIG SWITCH PROJECT

No 5

The National Trust is the first major heritage sector organisation to implement a nationwide programme to reduce the consumption of energy and production of waste across all its historic buildings. In its *Big Switch* project, some 40,000 light bulbs across their estate are being changed to energy efficient alternatives that have been specially developed with historic houses in mind by Philips Lighting. In the South East National Trust region alone, the Trust estimates that the outlay has been approximately £13.5k but will yield a reduction in carbon emissions of 140 tonnes per annum and energy cost savings in excess of £26k per annum. The project has been challenging because it relied on developments in technology to reduce the UV content of bulbs, which is particularly damaging for the sensitive historic materials found in many older buildings. The project has been so successful that an on-line ordering system will shortly be launched to help the owners of historic properties outside the Trust select the most appropriate bulbs for the areas they are trying to light.

5 Polesden Lacey has spent £1,465 on new light bulbs but will yield an annual saving of £2,975 and emit nearly 15 fewer tonnes of carbon.

## Reducing carbon footprint

BEHAVIOUR CHANGE

The key way in which energy efficiency and a reduced carbon footprint can be achieved is through behaviour change. It is often not the buildings or landscapes themselves that are inefficient but how energy is used by the people living in and visiting them. The National Trust has been particularly active in promoting this message to all its visitors. They actively encourage visitors to consider greener means of travel to sites. For example, in some cases bus routes to properties have been set up, and where this is not possible the Trust has promoted greener driving methods to their visitors. In addition, they are seeking to lead by example and have created *Big Green Days Out*, which have run at several properties throughout 2008, including Chartwell in Kent. The days promote lifestyles suitable for all sorts of properties, not just historic, and share tips and information on local food, green gardening and water saving measures. Even rubbish produced from the days is recycled or composted to have a minimal carbon impact. The Trust has produced a micro-site dedicated to greener living that should enable all its visitors and members to address their own carbon footprint. At the same time, the Trust and English Heritage have introduced policies to 'green' their own organisations, for example sourcing and providing only local food produce at catering outlets. Whilst all these initiatives may only bring about small changes individually, the cumulative effect can be substantial. Thinking globally but acting locally will have an impact. [www.nationaltrust.org.uk/main/w-chl/w-countryside\\_environment/w-climate\\_change/w-green\\_living.htm](http://www.nationaltrust.org.uk/main/w-chl/w-countryside_environment/w-climate_change/w-green_living.htm)

# Sources of Information

As an owner or manager of a historic property you should be aware that historic sites are affected differently by extreme weather damage and often require different solutions to modern sites. You should always seek specific advice from your local conservation officer.

It is important to be aware that adaptive changes to historic sites are not always economically viable or appropriate. They can in themselves pose challenges to, and damage the historic environment, and may not take account of the embodied energy of an existing building. Any changes that will affect the fabric of the site should always be well researched and planned, and owners and managers of historic sites should remember that much can be achieved to reduce carbon emissions through simple changes in lighting, heating and recycling – it is people who use energy, not buildings.

The following links should guide you through the latest research and guidance available across the sector to help you plan the most appropriate projects for your site.

English Heritage produces guidance and research on specific aspects of managing the historic environment in relation to climate change impacts, for example, what to do in the aftermaths of flooding. All guidance is available to download at [www.helm.org.uk](http://www.helm.org.uk) and [www.english-heritage.org.uk](http://www.english-heritage.org.uk). Also available on this website is the *Conservation Bulletin* dedicated to climate change, published in early 2008.

In 2008 English Heritage embarked on a research project, *Hearth and Home*, which will monitor the energy usage of Victorian houses, lived in by ordinary people, to work out best practice in measuring energy efficiency and the cost effectiveness of energy-saving options. ▼

## CLIMATE CHANGE AND YOUR HOME

In 2008 English Heritage launched a new website called *Climate Change and Your Home* [www.climatechangeandyourhome.org.uk](http://www.climatechangeandyourhome.org.uk) with the aim of helping owners of traditionally constructed homes, whether listed or not, to understand further the way in which climate change impacts on their home. The website provides advice on how to improve the energy efficiency of traditionally constructed homes without compromising their historic integrity and will become the primary conduit through which much of English Heritage's knowledge and technical guidance on climate change will be disseminated to home owners.

The National Trust provides further case study examples of the kinds of impacts they have seen at their properties, how they are responding to and planning for them, and the work they are undertaking to engage and educate their members and visitors on green living [www.nationaltrust.org.uk/main/w-chl/w-countryside\\_environment/w-climate\\_change.htm](http://www.nationaltrust.org.uk/main/w-chl/w-countryside_environment/w-climate_change.htm). The *Energy Saving Trust* also provides extensive information on this [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk)

The Church of England's *Shrinking the Footprint* campaign in conjunction with the Carbon Trust, provides information on reducing the carbon footprint of ecclesiastical buildings demonstrating that simple changes to use of lighting and heating can reap substantial reward without affecting the fabric of the building. [www.shrinkingthefootprint.cofe.anglican.org](http://www.shrinkingthefootprint.cofe.anglican.org) [www.carbontrust.co.uk](http://www.carbontrust.co.uk)

The Heritage Lottery Fund now provides advice on 'greening' heritage projects. Primarily aimed at ensuring projects they fund are appropriately focused on environmental sustainability and energy efficiency HLF also provides information on building materials, water, biodiversity and soil, and guidance on minimising the environmental impacts of visitor transport. [www.hlf.org.uk/HLF/Docs/HelpingYourApplication/Planning\\_greener\\_heritage\\_projects.pdf](http://www.hlf.org.uk/HLF/Docs/HelpingYourApplication/Planning_greener_heritage_projects.pdf)

A recent publication by the Empty Homes Agency on the sustainability of old buildings, *New Tricks with Old Bricks*, highlights the results from a study comparing carbon dioxide emissions in building new homes and creating new homes through refurbishing old properties. There are nearly 84,000 empty homes in the South East region. [www.emptyhomes.com/documents/publications/reports/New%20Tricks%20With%20Old%20Bricks%20-%20final%2012-03-081.pdf](http://www.emptyhomes.com/documents/publications/reports/New%20Tricks%20With%20Old%20Bricks%20-%20final%2012-03-081.pdf)

The Association of Environment Conscious Building provides advice on making buildings more sustainable [www.aecb.net](http://www.aecb.net)

Organisations like Climate South East exist to facilitate partnership work on the issue in the region and to disseminate the latest research findings. [www.climatesoutheast.org.uk](http://www.climatesoutheast.org.uk)

CABE published *Public space lessons: adapting public space to climate change* in July 2008. [www.cabe.org.uk/AssetLibrary/11637.pdf](http://www.cabe.org.uk/AssetLibrary/11637.pdf)

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