

31. CONSEQUENCES OF FUTURE CLIMATE CHANGE IN GUERNSEY

Andrew Casebow



Figure 31.1 *Sunset at Cobo Bay. In the short term Guernsey could become a popular holiday destination, whilst other European destinations are deemed too hot. However, long-term consequences of climate change are not so positive. Image courtesy of VisitGuernsey.*

Guernsey is in a remarkably favourable position. The islands appear set to become warmer throughout the year, but should not succumb to any of the more severe problems in the short-term. However, it is important to make a distinction between possible short-term 'gains' and the long-term impacts that could well involve serious flooding if the more dire predictions of sea level rise come to fruition.

Improving climate

In the 'short term' the temperature in Guernsey could increase, providing a climate more like that of central France today, which many would welcome. The island may even become a more sought after holiday destination if the summer-time climate 'improves' for holiday-makers, with hotter, sunnier days, and less rainfall; whilst other destinations are considered too hot.

Agriculture and gardening

For farming and horticulture this is likely to mean lower crop yields in the absence of irrigation but also the possibility that different crops might be viable; whilst in our gardens it may lead to a change to more Mediterranean planting schemes.

Energy and food security will become more important. Agricultural land is being used to grow crops for the production of biofuels. This is already leading to higher food prices and predictions that the era of 'cheap food' has come to an end. With an increasing world human population food 'security' and availability will become important once again. One of the island's weaknesses in the future will be its inability to feed its population and its reliance on imported produce.

Water resources

Water is one of the most valuable commodities. With much drier summers it will be even more important to conserve water and to avoid water pollution, and we will depend even more on water that has been stored from the previous winter rainfall. We are fortunate that Guernsey Water already has considerable water storage capacity.

Climate predictions suggest that the island will receive much more of its annual rainfall during the winter months in the future. Whilst this will place even greater stress on the need to conserve and store water, it will also mean that the flooding of low-lying areas is more likely. Greater consideration will need to be given to the possibility of flooding before building new developments. The risk of flooding could also have a considerable impact upon the island's infrastructure, its foul water drainage system and sewage treatment facilities. As the island depends on collecting clean fresh water from the whole island catchment, serious flooding could well cause pollution of the fresh water supplies.

Insurance

Insurance against the financial losses caused by the greater risk of fire, storms and flooding, is of increasing importance, and just one area where the human and financial expertise contained within our island could benefit Guernsey.

Human and animal health

Pests and diseases, particularly those carried by insect vectors, will have an impact on our human and animal population. Higher summer temperatures may become uncomfortable or kill vulnerable people and animals, whilst we will need to ensure that livestock have sufficient water to drink and shade from the sun.

Wildlife

Higher temperatures and the drying of many wetland habitats during the summertime will have consequences for the island's wildlife, and the changing seasons will affect the migration and breeding success of many species of birds. Some plants and birds at the southern extremity of their normal range might well die out, move northwards or not return, whilst others that are occasional visitors now may come in greater numbers, or breed within the island. Others may stay over-winter and not migrate southwards.

Conclusion

With the availability of good medical and veterinary treatment, ready supplies of food at a reasonable cost, sufficient water supplies and a beautiful environment, our island is likely to remain one of the most delightful and favourable places in which to live and work for many years to come.

32. CHANGES IN AGRICULTURE AND COUNTRYSIDE MANAGEMENT

Andrew Casebow

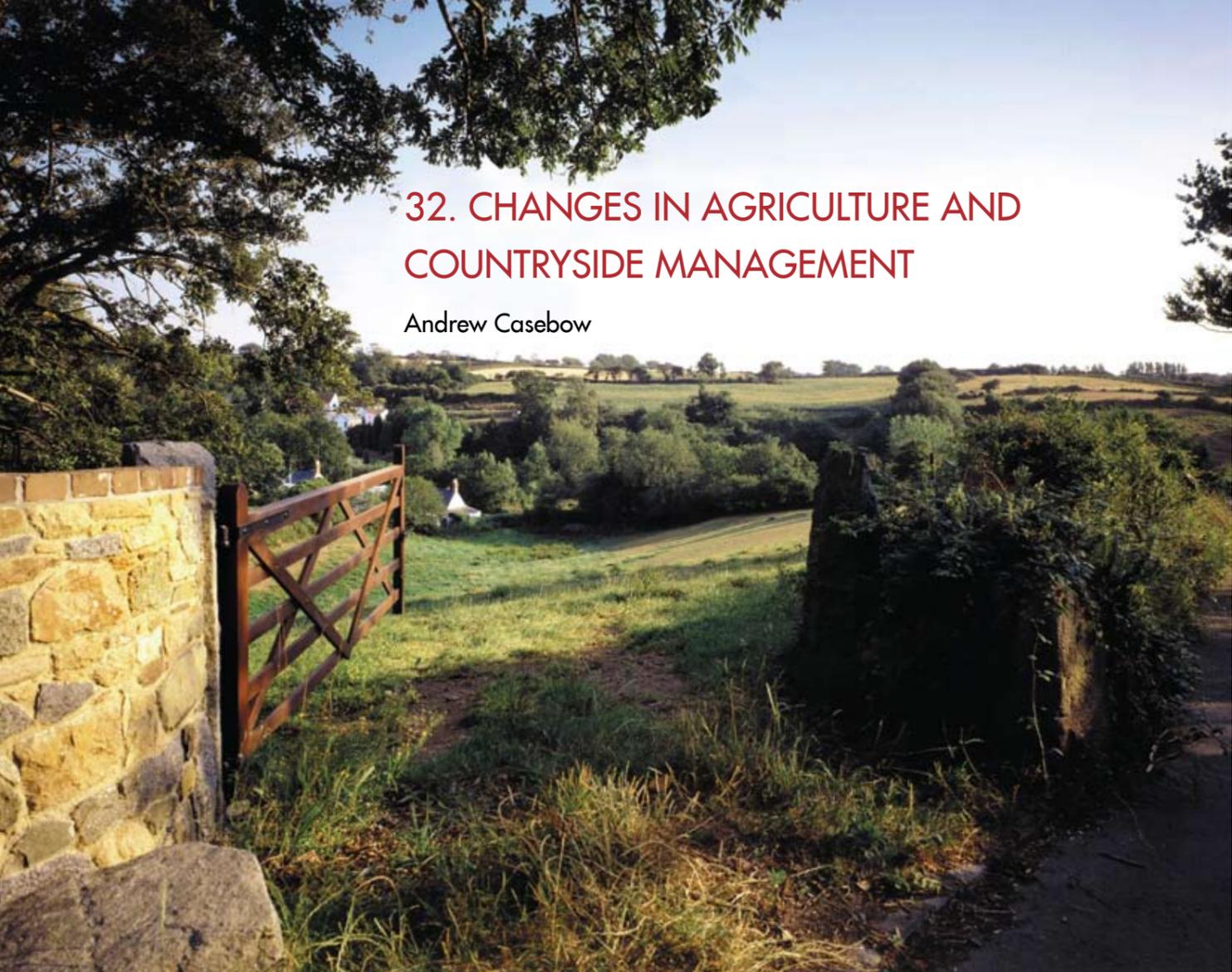


Figure 32.1 Guernsey's undulating countryside, just one of the island's many picturesque landscapes. Image courtesy of VisitGuernsey.

Whilst farming is the cornerstone of Guernsey's rural economy, it is widely accepted that agriculture has a multi-functional role, delivering not just food but other benefits, such as the responsible management of an increasingly endangered breed of dairy cattle, and the protection and enhancement of the Guernsey countryside.

Biodiversity

The biodiversity of the countryside, consisting mainly of farmed land, is likely to change. Wildlife will be put under stress by the reducing rainfall and higher temperatures, that will cause wetland habitats to dry up in the summer; whilst the increasing winter rainfall could lead to greater flooding of farmed land in some areas.

Crop yields

In the early phases of climate change, crop yield could increase due to the warmer temperatures, the longer growing season and higher carbon dioxide concentration in the atmosphere. But yields are likely to decline as crops begin to suffer from a mixture of drier

soils in the summer and earlier maturity, which reduces the amount of solar radiation that growing crops receive. Whilst early potatoes may become earlier and higher yielding, main crop potatoes may only be viable where irrigation is available due to drier summers. Similarly some vegetable crops may only be viable if they are irrigated.

New crops and husbandry

Farmers and growers wishing to capitalise on niche markets will grow new crops. An example of this is the English winemaking industry, which is expected to expand. Whereas the climate was only suitable until recently for white wine production, champagne producers are now moving to England from France and red grape varieties are being planted. It would

be surprising if local Guernsey growers did not plant vineyards and start making Guernsey wine. There are also opportunities for many different niche crops, such as outdoor herbs, and unusual fruits and nuts such as apricots and almonds, which thrive in frost free environments. Some gardeners are already growing outdoor olive trees and it is only a matter of time before some enterprising grower starts to plant citrus fruit, although it is doubtful whether these would be commercially viable.

Livestock may increasingly be housed during the mid-summer. Pigs suffer badly from sunburn and whilst the Guernsey breed of dairy cattle thrives in hot climatic conditions, they welcome shelter from the sun and sprays of cooling water. The availability of a constant fresh water supply during the heat of the summer is particularly necessary for all animals.

Safeguarding agricultural land and wildlife habitats

Although the available agricultural land in Guernsey could not feed the island's population, safeguarding agricultural land for future food production could be vital as world population increases, food crops become more expensive, and food security becomes important once again. Wildlife, too, needs space and suitable habitat in which to thrive.



Figure 32.2 Camomile and Corn Marigold in a wild flower meadow.

The importance of refrigeration

Increasing temperatures will also affect the durability of farm crops and food, and wastage during storage and transport will be an increasing concern. Food freshness is maintained by refrigeration in the human food chain, and this will be increasingly important to maintain food quality.

Due to increasing temperatures and demand for longer shelf life, refrigeration will become essential for many foodstuffs. For instance, milk must be cooled quickly after production at the farm and it is important to ensure that there is a consistent cold-chain from the farm, to the dairy, to the customer, and to the point of consumption to ensure that fresh milk and dairy products retain their quality.

33. THE CHALLENGE OF GLOBAL WARMING FOR GARDENERS

Peter Danks ^[1] and Andrew Casebow



Figure 33.1 Gravelled garden at Jerbourg. In the event of further global warming, and increasing droughts, maintaining a lawn may prove difficult.

The drier summers and wetter winters that are predicted in the future will not prevent us from gardening. However, we will probably need to change the varieties of vegetables and flowers that we grow, and learn to conserve water and use it more sparingly in the future. In some ways it could even be quite exciting as we can experiment with unusual varieties of plants and trees that are not tolerant of frost and are normally considered to be 'Mediterranean'.

Coping in drought conditions

Conserve water by:

- Using less water, but more effectively.
- Using "grey" water, e.g. use bath water / shower water.
- Storing as much rain water as possible.
- Improving the water-holding capacity of garden soils by increasing their organic matter content. In other words, using more compost.
- Reducing the wind-speed over the garden by planting more hedges, both deciduous and evergreen, according to locality.
- Hoeing open soil in vegetable plots regularly to create a loose soil mulch and reduce weed competition.
- Using a "floating mulch" ^[2] in vegetable plots. This will reduce evaporation and pest attack.

Reduce water loss and encourage plant growth

The following may be useful:

- An old carpet or permeable black plastic mulch, on its own or under gravel, will conserve water and may help to reduce weeds.
- Composted bark, garden compost or fresh lawn cuttings. (These materials need to be at least 3-4 inches (7-10 cm) thick if they are to properly smother weed growth.
- In the vegetable garden use raised beds, these give a greater depth of soil for deeper root penetration.
- Sowing plants in a deep drill and earthing-up after germination gives added rooting depth.
- Paths can be loose-paved to conserve moisture.

Use shade to good effect

This will become more essential in long, dry spells. Living shade will absorb water. Some plants have deep roots whilst others, like Eucalyptus, have massive spreading roots; so choose plant associations carefully. If in doubt, ask your nurseryman for advice on the particular species that you fancy before purchasing.

Lawns and vegetables

Lawns may well need a different balance of grass species, which are more drought tolerant, and maintaining a pristine lawn may prove difficult. The use of water sprinklers to maintain a green lawn may be socially unacceptable when water is a scarce commodity. However, if you are using 'grey' or saved rainwater in the vegetable garden, apply through low level watering lines or a leaky pipe system to place water where it is most needed and reduce evaporation. Fresh food may become more expensive as the climate becomes drier and there are more 'mouths' to feed. There is increasing interest in vegetable growing for personal consumption, and more people may value keeping an 'allotment' and growing at least some of their own food.

Which plants to grow?

Not all plants from warmer/drier climates are likely to do well here, especially some plants that have a particular day length requirement for successful flowering and cropping. Although winters will be warmer than now, they are still unlikely to be suitable for plants from the tropics.

Think more of plants from the Mediterranean, South Africa, Australia, New Zealand and South America, so that many of the palms, southern beech, cistus and citrus and hardier bananas become interesting subjects. Conifers, evergreens and the more drought tolerant succulents could be useful if they can tolerate a wet winter.

Some of the plants that we grow now may not succeed because they require more cold than is likely in the future. Small alpine plants and bulbs come into this category.



Figure 33.2 Vegetable allotment at St Martin's in Guernsey.

Conclusion

The secrets to success are to conserve water and use what we have wisely. Protect from wind and sun and, above all, research the plants you think you would like to grow in your garden. Do not rush into things. For gardeners, the future could be an exciting challenge.

References

1. Peter Danks has been gardening in Guernsey since 1968, both professionally and as a hobby. Before retirement he was a horticulture lecturer and adviser.

2. A floating mulch is a very fine polyfibre woven film that allows moisture but not insects to penetrate.

34. CHANGES IN WILDLIFE HABITATS AND SPECIES

Pam Berry^[1]



Figure 34.1 Conditions could become unsuitable for plant species such as the bluebell from the 2050s onwards.

Image copyright C David, Guernsey Biological Records Centre.

Observed changes in climate are already having an impact on the biodiversity of Guernsey, but what might be the impacts of the projected climate changes?

Research in the MONARCH project ^[2] in Britain and Ireland have shown that there are species that could benefit from climate change (“winners”), and those that could lose suitable climate conditions (“losers”), while some species, especially on a small island like Guernsey, may continue to find suitable climate space. Similar work has been carried out for Europe in the BRANCH ^[3] project and this has been used to inform this chapter.

Woodland, wetland and coastal habitats are important in Guernsey, although they occupy less than 8% of the land area. Grasslands and agricultural land can also contribute to wildlife, especially if they are appropriately managed. Key woodland species include elm, ash and oak. Wych elm, ash and oak show increasing vulnerability to climate change, such that potential suitable climate space could be lost from Guernsey by the 2020s, 2050s and 2080s respectively (Figure 34.2). Key ground flora plants include greater wood rush, bluebell and black bryony and while the former could continue to find potential suitable climate space in Guernsey, conditions could become unsuitable for bluebell from the 2050s onwards.

Wetlands comprise a range of habitats including grazing marsh, salt marsh, brackish water and freshwater ponds. The balance between these fresh, brackish and salt water habitats is likely to change as a result of sea level rise on low-lying parts of the coast. Coastal habitats and their species will try to

move inland, but where hard coastal defences and built development limit this movement they may be lost. Key species include: strawberry clover, common saltmarsh grass, greater pond sedge, reed and duckweed. Climate change should not significantly directly affect available climate space for these species, but other more water-level sensitive species may be adversely affected.

Coastal habitats, such as sand dunes, shingle, scrub and some grassland, will be similarly affected by sea level rise. Key species, such as marram grass and gorse, could continue to find potential suitable climate space, although Guernsey could start to become unsuitable for western gorse from the 2050s onwards. The success of species associated with scrub, arable and grassland will depend very much on management, but some associated species, such as blackthorn, bracken, dog violet, common St. John’s wort could continue to find suitable climate space, while honeysuckle, bramble, sheep’s sorrel and early purple orchid could be adversely affected as climate change progresses.

These suggestions of the potential impacts of climate change are based on climate alone and thus do not include many of the other factors that can affect a species’ distribution, including availability of suitable habitat and interactions with other species. They do, however, give an indication of some of the changes that might occur and for which species adaptation actions might be necessary.

Figure 34.2 Changing potential suitable climate space under the HadCM3 A2 scenario for Wych elm (a to c), ash (d to f) and oak (g to i), where green represents overlap between current and future potential suitable climate space, red represents loss and blue gain^[4].

Wych elm

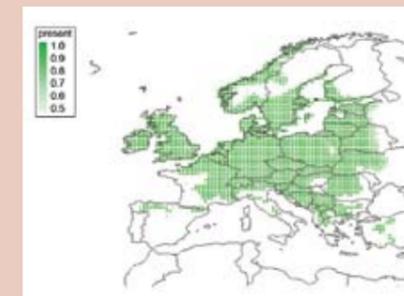


Figure 34.2a Simulated current European climate space.

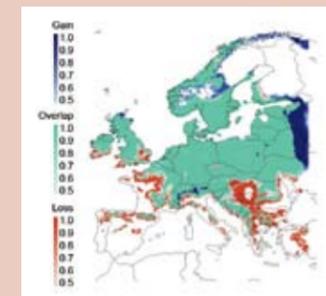


Figure 34.2b Potential suitable climate space for the 2020s.

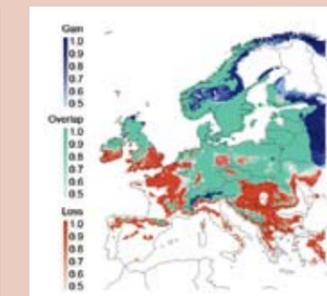


Figure 34.2c Potential suitable climate space for the 2050s.

Ash

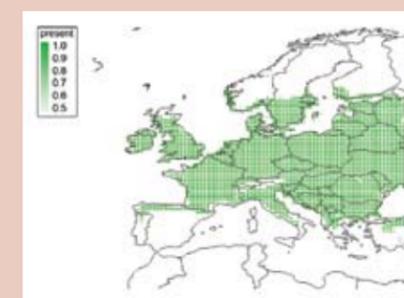


Figure 34.2d Simulated current European climate space.

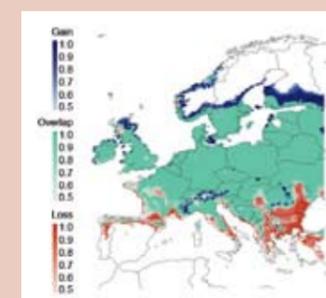


Figure 34.2e Potential suitable climate space for the 2020s.

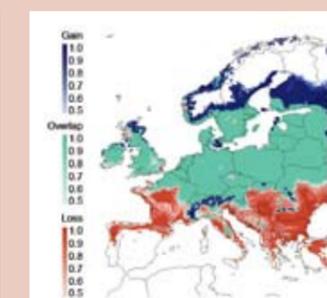


Figure 34.2f Potential suitable climate space for the 2050s.

Oak

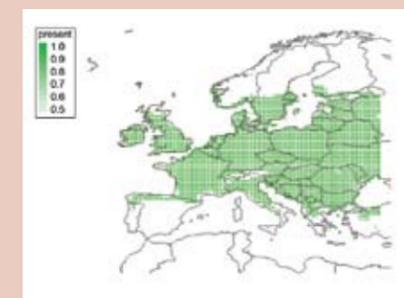


Figure 34.2g Simulated current European climate space.

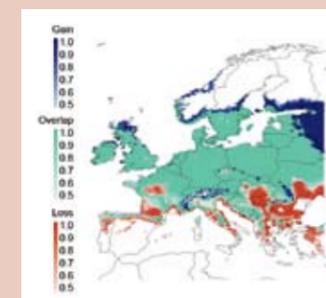


Figure 34.2h Potential suitable climate space for the 2020s.

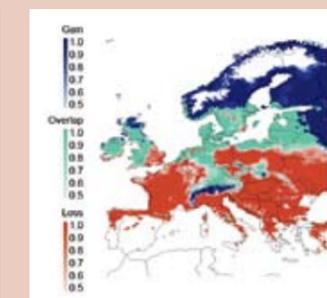


Figure 34.2i Potential suitable climate space for the 2050s.

References

1. Dr. Pam Berry, Environmental Change Institute, University of Oxford. Her research interests include various aspects of the potential impact of climate change on landscapes, ecosystems and selected groups of plant species.
2. Berry, P.M et al (2005). Climate change and nature conservation in the UK and Ireland: modelling natural resource responses to climate change (MONARCH2). UKCIP Technical Report, Oxford. (Available from www.ukcip.org.uk).
3. BRANCH (Biodiversity Requires Adaptation in Northwest Europe under a Changing Climate) was funded under the EU Interreg IIIb programme.
4. James Paterson carried out the modelling.

35. POTENTIAL IMPACT ON HUMAN HEALTH IN GUERNSEY

David Jeffs ^[1]



Figure 35.1 Traffic-jam along Les Banques in Guernsey. Transport pollution is a threat to human health and to the environment. Pictures reproduced courtesy The Guernsey Press Co Ltd.

Guernsey is fortunate that in being a small landmass surrounded by sea, many of the more extreme effects of climate change will be ameliorated. However, rising sea levels will mean that many parts of the island will be more prone to storm surges and flooding, whilst any change in the Gulf Stream could have a major impact on the islands 'microclimate'.

Apart from 'major disaster' scenarios associated with increased risk of storms, flooding and other natural events, impacts on human health are likely to parallel, but be less extreme than those predicted in the UK.

In particular:

- Cold and heat-related winter and summer peaks in mortality are likely to be less extreme.
- Cases of food poisoning can be to some extent controlled by effective environmental health enforcement of food hygiene legislation.
- Without a change in public attitudes towards sun exposure, we are likely to see an increase

in sun related skin cancers. At present, the incidence rate of malignant melanoma in Guernsey is some two to three times higher than that of England and Wales overall, although part of this is believed to be due to a more affluent population getting greater non domestic sun exposure.

- With a high level of car ownership and usage, existing peaks of atmospheric pollution associated with high pressure systems are likely to increase, and in the absence of integrated traffic policies, lead to increased respiratory disease, particularly of acute asthma, and of exacerbations of chronic pulmonary disease.

- The likelihood of an increase in vector borne diseases, such as malaria and lyme disease is problematic. Although a rise in temperature may encourage mosquitoes and other potential vectors to breed, much can be done to control this through environmental interventions.
- For example, malaria was common in parts of Italy until the seventeenth century, but was successfully controlled through environmental measures such as draining the marshes in low lying areas.
- Similarly, climatic conditions are very suitable for malaria to be reintroduced into the Darwin Region of Northern Australia, but this is prevented by judicious spraying and other public health measures.
- In Guernsey's much smaller land area, it is hoped that environmental and public health interventions would be more effective in preventing new diseases becoming established.

However, in a jurisdiction of less than 65,000 people, annual deaths and morbidity from any single category are likely to be low, and year to year variability wide. Possible 'indicators' will be 'soft', and what influences them multifactorial.

It will therefore be extremely difficult to formally attribute all or part of any changes to the effects of climate. Nonetheless, we can be certain that climate change on a global scale will impact on human health, but there is much that can be done to minimise these effects, as summarised above.



Figure 35.2 An increased risk of sunburn due to greater sun exposure will result in a higher rate of sun related skin diseases.

Further reading:

Human Frontiers, Environments and Disease: Past Patterns, Uncertain Futures, by Tony McMichael, Cambridge University Press, 2001.

References

1. Dr David Jeffs is Director of Public Health, Department of Health and Social Services.

36. POTENTIAL IMPACTS ON ANIMAL HEALTH

Chris Bishop^[1]



Figure 36.1 Exotic diseases in dogs and cats are currently monitored by the UK government.

Many experts believe that a number of serious diseases in dogs, cats, cattle, sheep, goats and horses, currently only seen in the warmer, more southerly latitudes could establish themselves further north if climate changes predicted by the IPCC were to occur. Some of these diseases are also capable of being transmitted to man.

In dogs and cats the UK government regularly monitors a large number of exotic diseases in a scheme known as DACTARI. From this data we already know that many of these diseases have been detected in animals arriving in the UK from warmer countries on the Pet Passport Scheme.

Exotic diseases of dogs and cats include:

- **Babesiosis** - a serious disease of dogs caused by a protozoan organism. Various species of tick (Figure 36.2) carry and spread this disease, currently seen in southern and central Europe and Africa.
- **Ehrlichiosis** - seen in dogs and cats caused by a rickettsial organism. Various species of tick carry and spread the disease, currently seen in Europe. The disease is also transmissible to people.
- **Heartworm** - a very serious disease mainly of dogs, but also seen in cats, caused by a parasitic worm that lives inside the heart and major blood vessels. The disease is carried and

spread by various species of mosquito (Figure 36.3), currently seen in southern and central Europe.

- **Leishmaniasis** - a very serious disease of dogs caused by a protozoan organism. The sandfly (Figure 36.4) carries and transmits this disease and is seen in southern Europe. The disease is also transmissible to people.

At the moment, species of mosquitoes and ticks that spread these diseases are found mainly in the warmer Mediterranean countries or further south, but with climate change and warmer weather conditions some of these diseases could become endemic further north. In the larger domestic species, cattle, sheep, goats and horses, the situation is similar. The following diseases currently only seen in Mediterranean countries could establish themselves more northerly if climatic change were to occur.



Figure 36.2 Ticks carrying exotic diseases, currently seen as close as southern Europe.



Figure 36.3 A parasite carrying mosquito, currently seen in central and southern Europe.



Figure 36.4 Sandflies carry and transmit disease to dogs and humans, currently seen in southern Europe.

Exotic diseases of cattle, sheep, goats and horses include:

- **Bluetongue** - a serious disease mainly seen in sheep but also in cattle and goats, caused by a virus. It is spread by several species of midge. Bluetongue spread to Northern France, Belgium, the Netherlands and Germany in 2006. It re-emerged and spread northward in 2007, and there have been over 4000 cases to date. The first case of Bluetongue in the UK was confirmed at Ipswich in Suffolk on 22nd September 2007, and there were 24 cases by early October.
- **African Horse Sickness** - a serious disease seen in horses caused by a virus and spread by the same midge causing Bluetongue. Currently seen in Spain, Portugal and throughout Africa.

Situation at the moment

Local Vets have already noticed an increase in the number of fleas, ticks, mites, and flies on pets in recent years. The warmer summer months are the normal peak season for infestation but recently this has extended into the winter months too.



Figure 36.5 Local vets will continue to ensure your pets remain strong and healthy.

References

1. Chris Bishop, MRCVS, is Guernsey States Veterinary Officer and a partner in Isabelle Vets.

37. POTENTIAL IMPACTS ON PLANT HEALTH

Terry Brokenshire^[1]



Figure 37.1 Oak trees with leaf loss caused by pests such as the migrating Oak Processionary Moth. A potential threat for Guernsey in the future. Image courtesy of Forest Research.

Plant disease is an interaction between the host plant and the pathogen (fungus, bacterium, insect, mite, virus or nematode). Global warming could influence the health status of plants by affecting both the plant and the pathogen.

Plant stress

If climate change causes more extreme growing conditions then this will place stress on plants making them more prone to pest and disease problems. Severe droughts have been implicated in oak decline and in predisposing oak trees to numerous minor pathogens. Increased plant stress has also caused an increase in Honey Fungus on trees and shrubs (Figure 37.2). Notably, the disease has been confirmed on some of the more resistant species like Holly and Yew.

New plant species

There is a significant change in the ornamental species being sold in garden centres. Gardeners are demanding more exotic and drought tolerant species from various parts of the world. This will encourage a different range of plant problems with new pests and diseases arriving and perhaps a few local minor pathogens increasing in importance on plants at the edge of their climatic range.

Increased activity of mites and insects

Global warming will also have a direct effect on the pathogens, in particular, mites and insects that thrive in warmer drier conditions. Glasshouse pests could become significant problems on outdoor plants. The mild Guernsey climate already allows the Glasshouse Whitefly to overwinter outside. The notorious Two-Spotted Spider Mite is normally a glasshouse species but there have been several reports from the UK where the pest is active on outdoor plants in early May, and we have recorded the Glasshouse Thrip on outdoor Viburnum causing serious damage. This is a sub-tropical thrip that cannot survive Northern European winters, but it appears to be living quite happily outdoors for most of the year in Guernsey.

This could extend to more serious pests such as the Tobacco Whitefly and the South American Leaf Miner. These two insects are normally confined to glasshouses where effective controls can be implemented to eradicate them, but if they start to survive outside then control will become problematical. The Tobacco Whitefly (Figure 37.3) is also a vector for numerous serious viruses of a wide range of plants, including the tomato.

There could also be an influx of pests from Southern Europe. Hopefully some of our current pests would migrate north to compensate! A good example of a pest migrating north from Central and Southern Europe is the Oak Processionary Moth, which is a major defoliator of oaks. The moth is also a risk to human health as the caterpillars are covered in irritating hairs that contain a toxin and skin contact can cause irritations and allergic reactions. The moth is now firmly established in Northern France and Holland and outbreaks have been found in parts of London.

Another recent introduction is the Rosemary Beetle, a native of Southern Europe, which is now a significant pest of Rosemary, Lavender and Thyme. It was first found in London in 2000 and since then it has moved throughout Britain including Guernsey.

Fungal diseases

Fungal problems may also be affected by climate change and there may be positive as well as negative effects. For example, drier summers may prove beneficial to reduce the ravages of some of our important wet weather diseases like Potato Blight and Apple Scab. However, the conditions will allow the powdery mildews and rusts to develop fully causing problems on important cereal crops and ornamentals.

Locally, the fungus *Corticium rolfsii*, the cause of Crown Rot of a wide range of plants, is a problem on crops grown under glass because the fungus is favoured by high soil temperatures. In the future we may see more outbreaks of this soil-borne fungus on outside crops as summer temperatures rise.

Warmer and wetter winters could allow root invading fungi greater opportunity to infect plants. The higher winter soil temperatures and wetter soil conditions could prove ideal for these fungi to become more active. Waterlogged soils could predispose the plant roots to disease.

Bacterial disease

Bacteria are more significant in warmer areas but normally require adequate moisture for infection and dispersal. Moisture availability at specific times of the year may actually limit increased bacterial development. Locally, bacterial problems are relatively few but the range could increase with global warming.

Affects on biological control

We must also consider the affects of global warming on the natural bank of parasites and predators on many of our pests. Global warming should have a positive effect on their activity and could act as a natural 'brake' on pest development. Beneficial insects and mites introduced into glasshouse environments could be used outdoors too. New beneficial species could also spread north adding to our current natural armoury.

Conclusion

The issue of global warming and plant health is highly complex because of the numerous interactions between the host plant, pathogen, predators, parasites and of course, man.



Figure 37.2 Honey fungus (*Armillaria mellea*), a problem of stressed trees and shrubs such as the Holly and the Yew.



Figure 37.3 The Tobacco Whitefly, a vector for numerous serious viruses of a wide range of plants, including the tomato.

References

1. Dr Terry Brokenshire, Crop Protection Officer, States of Guernsey.

38. BUSINESS AS USUAL – SIGNIFICANT BUSINESS RISKS

Andrew Casebow

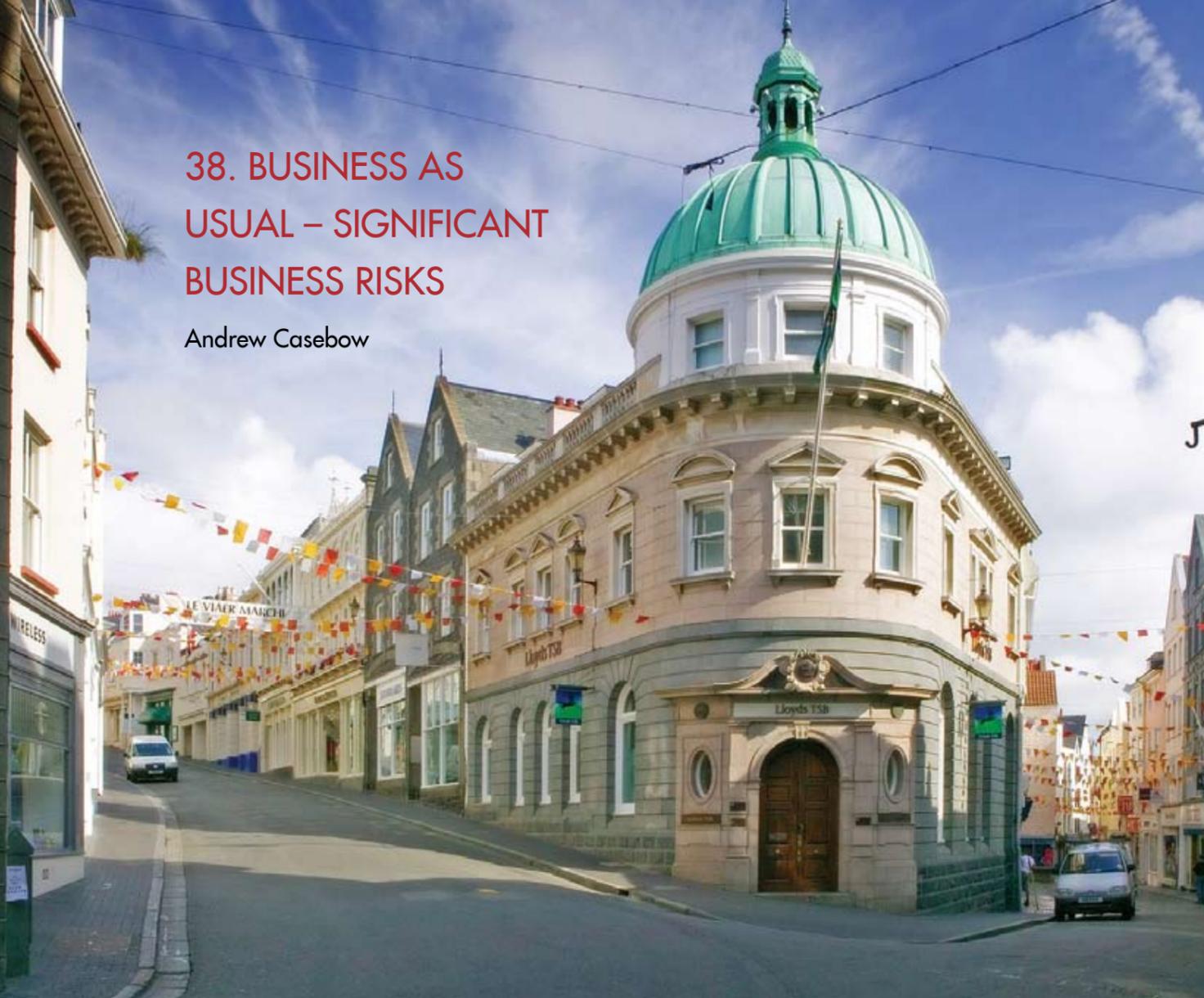


Figure 38.1 Guernsey businesses must have the ability to mitigate and adapt to climate change. Image courtesy of GuernseyFinance.

The management of climate change risk and impact should be approached through both mitigation and adaptation measures. Adaptation is action to manage the inevitable effects of climate change, whilst mitigation focuses on reducing greenhouse gas to minimise further climate impacts.

Adaptation has historically had a lesser focus than mitigation. However, it is the lack of adaptation that exposes financial institutions and the assets in which they invest, insure or fund, to extreme weather events, droughts and sea level rise for at least the next 100 years.

Although some financial service sectors (e.g. commercial property insurance) seem more exposed than others, the interconnectivity of the financial interests and the overarching responsibilities of regulators and policy makers, highlights the indirect risk to all financial sectors posed by our changing climate.

A report “Adapting to Climate Change” [1], has been published by the London Climate Change Partnership

(LCCP) Finance Group [2], which has members from Insurance (Association of British Insurers), Institutional Investment and Banking (Barclays, Lloyds), Accountancy (KPMG), as well as the Greater London Authority and the Environment Agency.

The report posed a number of key questions aimed at the Insurance, Banking, Pensions, Fund Management, Infrastructure and Utility sectors, to raise awareness and initiate discussion about climate change adaptation risks to business and markets. These all have relevance to Guernsey.

It concluded that adaptation to the inevitable climate change should be embedded within decision-making processes.

What can Business do?

- Businesses can respond to build resilience and climate-proof their interests. Uncertainty about the future is not a reason for inaction.
- There is sufficient information to enable the impacts of a changing climate over the next 40 years to be embedded in decision making at strategic and project levels. Adaptive management is feasible.
- Businesses should review their climate risk management strategies and check that they are responding to both the mitigation and adaptation agendas. Action is required on both - now.
- Taking adaptive action early may be cost-effective when compared with the costs associated with remedial action at a later date (although clearly such investment decision has to be subject to its own financial appraisal). When analysing potential action, companies should consider their fiduciary responsibilities.

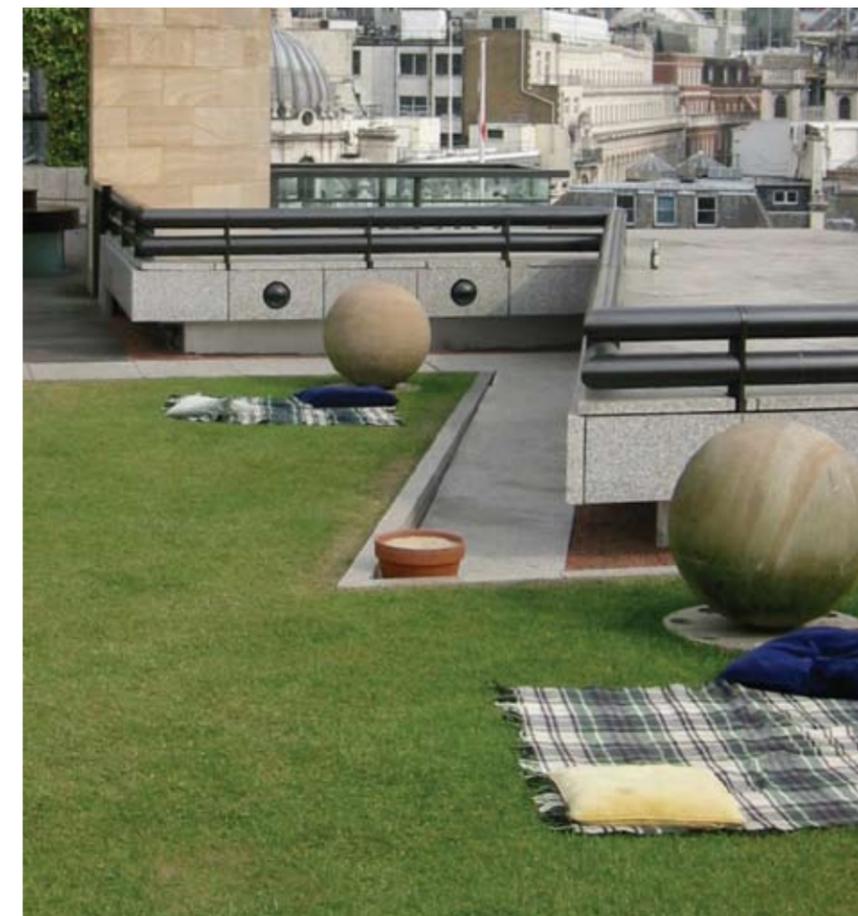


Figure 38.2 ‘Green Roofs’ are effective thermal insulators which can save businesses money whilst being environmentally friendly.

Conclusion

Changing markets, customer needs and investor expectations will present significant opportunities for those companies that take action to climate-proof their business.

References

1. London Climate Change Partnership (2006). Adapting to Climate Change, Greater London Authority.

2. The London Climate Change Partnership ‘Finance Group’ has published a number of reports on the implications of climate change for the financial services sector. <http://www.london.gov.uk/climatechangepartnership/>.

39. INSURANCE RISKS AND BENEFITS

Martin Le Pelley ^[1]



Figure 39.1 Storm damage resulting from the 'Great Storm' of 1987. Pictures reproduced courtesy The Guernsey Press Co Ltd.

The development of insurance products (as a way of mitigating risk) has seen an upward trend since industrialisation. This is because the increasing size and complexity of risks has accelerated the need to spread the risk of catastrophic loss to ensure that there is business continuity in the event of some unforeseen problem or disaster. Without insurance, individuals and businesses could face financial ruin if they are faced by an unforeseen natural disaster which destroys their home or factory.

Storms as insurable events, as well as other natural disasters, are at the heart of insurance. The value and complexity of insurable risks in this modern industrialised world are continuing to escalate. Catastrophic losses arising from weather-related losses such as Hurricanes Katrina and Rita are estimated to be in excess of US\$100billion. One of the challenges of the world insurance industry arising from these major losses is to ensure that it has the financial strength to pay the enormous losses, which will arise from major disasters. It is a credit to the industry that it has shown the financial resilience to successfully withstand the shocks from catastrophic losses such as these hurricanes. Guernsey, through its position as the leading European captive insurance centre is playing its part in assisting in, and maintaining, a financially healthy world insurance industry.

Insurance can be a 'game of two halves'

Guernsey's insurance industry is operating in the centre of the market for industrialised risks, and therefore can benefit as much as suffer from these risks! Some of the

largest industrial companies in the world own captive insurance companies in Guernsey. Some do not buy insurance from any company other than their own captive insurance company. These companies are both complex and intelligent, they are sophisticated in their approach to assessing the risks to their organisation of global warming, and therefore can price these risks accordingly. This means that as more risks are transferred to Guernsey insurance companies, more premiums are also transferred to these companies to compensate them for taking on the risks. With more premiums coming into the island, the work required of insurance managers and investment managers increases. This has the benefit of improving the prosperity of the island.

At this point you might be wondering whether this implies that global warming and its acceleration might actually be a good thing for the island's economy. This is where a passionate debate might begin, because whilst the island is host to some of the most significant and globally sophisticated insurable risks, it is also vulnerable to these risks in the shape of increasing storms, sea levels, power-cuts and so on.

The insurance managers based on the island, and the Guernsey Financial Services Commission as the insurance regulator, play an invaluable role within the international community in overseeing and upholding the reputation of the island as a world-class insurance market. The island is well placed to embrace the opportunities that might flow from both the increased industrialisation of the planet, but also from the increased awareness and willingness to act to reduce the impact of global warming.

Most of us decide to purchase insurance so that we have the comfort of knowing that if disaster strikes we are confident that the insurance company will pay for a new roof. If the perceived risk or likelihood of your roof blowing off increases, then the insurance premium you will have to pay will also increase. In Guernsey, the risks relating to increasing sea levels, and possibly more severe storms caused by global warming exist, and may result in increased insurance premiums for locals. However, if these risks are outweighed by the benefit derived from a more buoyant economy caused by the increased risks elsewhere in the world, then Guernsey will derive a net gain as premiums flow into its insurance industry.



Figure 39.2 Tidal flooding at Cobo in Guernsey. Risks relating to events such as increasing sea levels may result in increased insurance premiums for locals. Conversely, increased risks elsewhere in the world may benefit Guernsey's insurance industry.

Conclusion

Unfortunately there are still many more questions than answers at this stage, and therefore the long-term impact of global warming on the island's insurance economy is simply too uncertain to predict with any degree of accuracy at this time. Reverting to a football comparison, you could say, that the result could go either way!

References

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