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Please cite this document as:

Simpson, M. (2010) Tourism in MCCIP Annual Report Card 2010-11, MCCIP Science Review, 11pp. www.mccip.org.uk/arc

EXECUTIVE SUMMARY

It has been well documented that at local, regional and global scales tourism, and the success of tourism operators, is strongly influenced by climate and weather. **Climate change is increasing the frequency of months when conditions are more comfortable for tourists in north-west Europe than in the Mediterranean.** As a result, the tourism industry is expected to grow in the UK and especially along the coast. **Warmer summers are expected to lead to an extended tourist season in the UK, especially at the coast, leading to increased revenues, new infrastructure, increased employment and enhanced watersport opportunities.** Across the UK, coastal tourism and marine recreation is concentrated around different natural and man-made attractions. In southern England, there is preference for beach visits and sailing, in Wales tourists take part in adrenalin-filled water-based activities or more leisurely visits to National Parks and in Northern Ireland coastal tourism is focused around sea fishing. Whilst warmer summers and milder winters are predicted to bring more tourists to the UK, the changing climate is not all good news. Over the past few years, negative impacts as a result of changing climatic conditions have increasingly been observed. Sea surface temperature is increasing, sea levels are rising and the frequency and intensity of storm surges have been enhanced. As a result, coastal erosion is increasing and coastal communities are increasingly threatened by flooding and inundation events. Predictions suggest that the UK will continue to experience these climatic changes and the impacts will increasingly be experienced.

Any increase in coastal flooding, erosion and extreme events would be expected to increase damage to coastal communities, tourist accommodation and transport links, whilst also posing an increased safety risk to marine recreation activities. It is essential to further identify the activities offered in the different locations and to understand the impacts of the changing marine climate on the UK. To ensure sustainable development of the sector, it is essential that policy makers understand the direct and indirect impacts of climate change on both tourism infrastructure and tourists' perception. Changes in the marine climate have already affected the coastal environment which may affect the attractiveness to some tourists. Further data collection and research is needed on the direct and indirect impacts of climate change that may affect coastal tourism such as the quality of the beaches (coastal erosion), the fish population (fishing tourism), the safety of the activity (sea level rise, extreme events) biodiversity (wildlife watching) and weather conditions (adventure sports).

Increased visitor numbers could overwhelm small coastal communities with implications for infrastructure, energy, water and waste management and environmental degradation. Understanding the carrying capacity of the tourist sites is also essential to manage the new flow of visitors and minimise the negative effect on the environment and socio-economics.

FULL REVIEW

1. What is already happening?

i) In coastal England: the Northern North Sea (part), Southern North-Sea, the Eastern English Channel and the Western English Channel.

Tourism in England is heavily concentrated around the London area (Office for National Statistics (ONS), 2009). However, the English coasts have always been a destination for domestic tourism and have become a significant segment in the sector for international tourists more recently (ONS, 2009; Visit Britain, 2009; Visit England, 2009). The English coast encompasses four 'Charting Progress' regions (as identified by Defra, 2005). These are the Northern North Sea (part), Southern North Sea and the Eastern and Western English Channels. Tourism on the English coasts traditionally mostly occurs during the summer months and includes activities such as beach, boating/sailing and fishing.

Currently, little is known about the impact of marine climate change on coastal tourism and marine recreation in England. However, changes to the coastal environment have been noticed during the past few years. A general warming of the region and, in particular sea surface temperature, allow the beaches and coastlines to become very attractive in summer. Coastal water temperature around the UK has increased by about 0.7°C in the last 30 years (Murphy et al., 2009). However, sea level rise, increase in wave height and storm surge have all enhanced coastal erosion and, as a result, more than 25% of the shore is being severely eroded. Fish and Moore (2005) suggest that cliff erosion and instability is increasing around the UK and that climate change is one of the primary drivers of this change.

Extreme events have become more frequent with storms and floods becoming more common and more intense (Murphy et al., 2009). These factors may contribute to an adverse perception of the region on a national and international scale (e.g. Bigano et al., 2005; Gössling et al., 2006). For example, the severe flooding in Cumbria in November 2009 resulted in 41 per cent of tourism businesses experiencing booking cancellations (Cumbria Intelligence Observatory, 2010). In addition, a fifth of businesses questioned believed subsequent enquiries and bookings were down and more than a quarter were concerned about the impact on public perception of the area (Cumbria Intelligence Observatory, 2010).

ii) In the Irish Sea: coastal Wales, Isle of Man and coastal Northern Ireland.

Wales

Tourism is a vital part of economic prosperity and job creation in Wales and is divided into the two categories of coastal tourism and heritage tourism (Welsh Assembly Government, 2007). In 2000, the Welsh Assembly Government, through the Welsh Tourist Board, launched a new strategic initiative, repositioning Wales as a short-break activity tourism destination and promoting coastal activities (Wales Tourist Board, 2000). A series of strategies were developed to guide the marketing and development of key activity tourism products (e.g. Time for Action – adventure tourism) (Welsh Assembly Government, 2007). Activities in Wales include water sports such as surfing, diving and climbing as well as fishing and boating. Over the past decade, this strategy has proved efficient and tourism has increased significantly (ONS, 2009). Over the same time, there have also been slight, but significant improvements in summer weather conditions (Jenkins et al., 2007).

The Welsh coastline and beaches are a major attraction and, as a result, the Welsh Assembly Government also promotes coastal national parks and protected areas as a holiday destination. However, due to climate change, coastal erosion and sea level

risers have been observed on 23% of the Welsh coasts (EUROSION, 2004) potentially having a negative effect on the recent increase in tourism.

The warmer summer months have also allowed water sports activities such as surfing to develop extensively and Wales now has many of the UK's most popular surfing sites (e.g. www.surfinginwales.co.uk). The demand has increased and surf schools and tour operators have largely extended the season to almost six months of activity during the year. The Irish Sea is more sheltered than other coastal areas of the UK so seasonal differences in wave heights tend to be lower than other locations (Fealy et al., 2006). This stability has been beneficial to the surfing industry. Furthermore, there is no obvious trend in the available data to suggest that extreme events have noticeably increased in the region (Brown et al., n.d) and the coast has remained relatively unaffected.

Isle of Man

Tourism makes a significant contribution to the Island's economy. The Isle of Man has a low population density with a largely undeveloped moorland landscape and rugged coastline, which is very popular for outdoor and water sports. To date, tourism marketing efforts have emphasised the landscape value and the environment of the Isle of Man (Isle of Man Government, 2010a). The choice of activities includes golf, sea and river fishing, sailing, windsurfing, mountain biking, diving and rambling.

Due to the location of the Isle of Man, the Irish Sea is the main factor to consider when dealing with climate of the island. Adverse marine climate change impacts can have a significant effect on the tourism sector. For example, the Douglas Promenade area is the most important area for tourist accommodation and many of its buildings are already susceptible to flooding from storm surges. Extensive information has been collated, by the island's Government, on the potential impacts of climate change. The Isle of Man's tourism strategy includes initiatives to cope with increasing flood risk and storm surges such as the redevelopment of the main tourism hotspot (The Douglas Promenade and the Summerland site) (Isle of Man Government, 2010b). The Government has also started to further identify future maintenance needs for older buildings.

However, climate change is not perceived, by stakeholders, as the main issue to be concerned about even though specific problems, such as accommodation being susceptible to flooding, have been identified (Firth and Hutchins, 2006). The same stakeholders currently consider that climate change will bring potential beneficial impacts such as increased demand. However, these may be countered by issues of accommodation standards and environmental quality. Climate change is now a consideration in all tourism development or maintenance projects and is seen as a potential opportunity to extend the season (Firth and Hutchins, 2006).

Northern Ireland

The coastline of Northern Ireland is characterized by stretches of cliff and rock, tidal inlets and sea loughs, as well as stretches of long sandy beaches and dunes. Twenty per cent of the coastline is already suffering from coastal erosion due to sea level rise and high wave height, and most of it has had hard engineering features installed to prevent erosion (EUROSION, 2004). In recent years, Northern Ireland has also experienced a strong increase in the frequency and intensity of extreme events with strong gales and winds (Arkell et al., 2007). These have, in some instances, had significant economic impacts especially for accommodation and attraction providers (NITB, 2008). As Ireland is dependent on sea and air transport for tourism, it is particularly vulnerable to bad weather conditions in the form of strong winds or gales as tourists are unable to travel.

Tourism is a growing market and coastal activity and marine recreation include water sports, boating and yachting and, most importantly, fishing. Fishing for species including salmon, grilse, sea trout, brown trout and sonaghan, in and around Northern Ireland is a major recreational and economic activity. The unpolluted coastal waters make for an internationally recognized sea fishing sector which is also very popular among the Northern Ireland population.

iii) In coastal Scotland: the West Coast, the Minch and the Northern North Sea.

Tourism is a major industry in Scotland and attracts both international and domestic tourists (ONS, 2009). Tourism and recreation contributes significantly to the Scottish economy, and directly provides over 210,000 jobs (Visit Scotland, 2008). According to Visit Scotland the main reasons for visiting the country are the diverse range of landscapes and natural habitats and the rich Scottish history and culture (Visit Scotland, 2008). The main attractions include historic monuments and museums, mountain climbing and hill walking, water sports, golf and winter skiing.

Coastal tourism is not one of the main segments of Scottish tourism (Viner and Agnew, 1999). However, the country does suffer from an adverse perception due to the inclement weather. Fishing tourism has always been very popular and is well renowned internationally. The provision of other water sport activities, such as sailing, along coastal areas is also increasing.

Scotland offers a varied sea fishing experience with an abundance of species (including cod, pollack, salmon, bass, skate) coupled with magnificent coastal scenery and the option to fish from both shore and boat.

Scotland offers a range of more extreme water-based adventure activities such as kayaking and surfing. These activities greatly depend on the quality of the coastal environment and are influenced by the coastal climate. Any changes in the marine climate will potentially threaten the sustainability of this industry.

Scotland is the part of the UK where, to date, the annual mean temperature has increased less than in other parts of the country (Defra, 2005). Research has shown that the Northern North Sea and the Scottish continental shelf have experienced significantly less warming than other coastal regions in the UK (Defra, 2005). Only 12% of the Scottish coasts have experienced coastal erosion (compared to 30% in England and 23% in Wales) (EUROSION, 2004).

2. What could happen in the future?

i) In coastal England: the Northern North Sea (part), Southern North-Sea, the Eastern English Channel and the Western English Channel.

Current climate change predictions suggest that England will experience warmer wetter summers and milder drier winters. With predications of milder winters and more reliable summers (Murphy *et al.*, 2009), the tourist season may be extended although the summer will remain the busiest time. The English tourism sector should benefit from these changes in terms of perception of the country and in terms of an increase in overseas tourists. Amelung and Viner (2006) projected a decline in the suitability of the Mediterranean for tourism during the summer and a parallel increase in the suitability for tourism in northern Europe. Domestic tourism is also likely to become more popular and the coast, especially the south coast, is predicted to experience a high increase of visitors (Viner and Agnew, 1999; SWCCIP, 2003).

However, changes in the marine climate are also likely to continue and potentially weaken the tourism industry. Sea levels and wave heights are expected to continue

to apply additional pressure to the already developed English shoreline. For example, sea levels are thought to be rising by 3mm each year in Cornwall (CCRM Ltd, 2008).

Recommendations to increase understanding of the potential impacts

Infrastructure, including roads, railways and buildings, located along the coast will become increasingly vulnerable to flooding and inundation events. A better characterization of infrastructures and attractions located within threatened areas should be undertaken to assess just how vulnerable these areas are and the severity of any potential impacts.

In addition, the impact of the predicted increase in tourism numbers needs to be assessed. Many tourists visit some parts of the English coastline for its scenic beauty and quaint villages. If visitor numbers do increase significantly these areas could be overwhelmed and the attractive features undermined. Many coastal areas have traditionally welcomed tourists in relatively low numbers. Careful consideration is required to assess how these areas can best manage any increases in tourists. Further research is also required to understand and plan for the efficient use of energy and water and the development of appropriate waste management.

ii) In the Irish Sea: coastal Wales, Isle of Man and coastal Northern Ireland.

Wales

As in other parts of the UK, coastal tourism in Wales is highly dependent on the quality of the shore and sea environment.

Sea level rise and an increase in wave height are predicted around the coastline of Wales by the end of the century (IPCC, 2007) contributing to further coastal erosion and damage to the scenic landscapes upon which tourism depends (Viner and Agnew, 1999; Defra, 2005). The opportunities for activities such as abseiling and climbing may be reduced due to the increasing precariousness of cliffs.

Any increase in both the sea surface temperature and the near bottom temperature of the Irish Sea is likely to affect the distribution of fish species (Defra, 2005) resulting in a negative impact upon the fishing tourism sector. Uncertainty in the projections of future temperature in the region includes that associated with changes in the large scale ocean circulation and high latitude ice-melt that may partially offset the predicted warming in this region (see the *MCCIP ARC Science Review 2010-11 Atlantic Heat Conveyor (Atlantic Meridional Overturning Circulation)*, Cunningham et al. 2010). There is still significant uncertainty within this area and further research into the impact of fish distribution is required. Studies and research conducted for the commercial fishery industry could be extrapolated to the recreational deep sea and coastal fishing sectors.

Isle of Man

The climate of the Isle of Man is significantly controlled by the surrounding marine climate. As conditions change in the Irish Sea, the Isle of Man is expected to get warmer, especially during the summer months. The tourism sector will benefit from an extended season and a more attractive overall climate for visitors. Potential issues resulting from an increase in visitor numbers and the potential impacts that climate change might have on tourism infrastructure have been identified (Firth and Hutchins, 2006). For example, the transportation system needs to be improved and the existing accommodation needs to be modified to offer increase protection against storm surge, floods and other extreme events.

The undisturbed landscape is predicted to change with the drying of moorland and changes in the vegetation structure (Firth and Hutchins, 2006). Any such changes

could have a negative effect on tourism numbers as the island may be perceived as less attractive to some potential visitors. Safety concerns are also raised as forest fires are thought likely to increase in frequency.

As fishing is a major tourist activity on the island, a warming sea and a warming climate may threaten the industry. Toxic algal blooms are already being monitored, as they are across the UK, and they have been predicted to increase in number and severity in the forthcoming decades (Defra, 2005) but confidence in this prediction is low (Bresnan *et al.* 2010). This will endanger the marine life and especially shellfish which is important not only for the fishing industry but also for tourism. The Isle of Man's fishing industry is concentrated on scallops and queen scallops (Isle of Man Government, 2010a) and each year the Island holds the Queenie Festival (<http://queeniefestival.com>) to celebrate the Manx Queenie (the local name for the Queen Scallop) (Isle of Man Government, 2010b).

The coastline of the Isle of Man is rich in marine life. The Irish Sea contains important populations of sea birds, fish and cetaceans including the bottlenose dolphin, grey seals and basking sharks. Diving and wildlife watching activities are prominent on the island and are responsible for a significant share of the tourism sector. The predicted increase in sea surface temperature is expected to have a serious impact on cetaceans and fish predators (Sea Watch Foundation, n.d; Evans *et al.* 2010). Smaller increases in temperature may have local impacts on the primary productivity of the Irish Sea and thus a local impact on potential food for cetaceans. A shift in plankton distribution and abundance will have implications for seals, dolphins and sharks in the area surrounding the Isle of Man which may have a knock-on impact for the popular wildlife-watching tourism operators.

Northern Ireland

Weather in Northern Ireland is predicted to become warmer overall (between 1 and 3.5°C by the end of the 2080s) and will become more welcoming to international visitors (Murphy *et al.*, 2009). However, as with all climate predictions there is huge variety (and differing uncertainty) depending on which climate change scenarios and models are used.

Research and surveys undertaken by the Northern Ireland government suggest that even though rain is seen by visitors as a downside of tourism in Ireland, it does not affect the overall quality of their trips (Northern Ireland Tourist Board (NITB), 2007). However, too much rain could cause significant problems. Floods are a major concern in Northern Ireland and any increases in flash flooding will have impacts on urban infrastructures, buildings (including built heritage), utilities and transport, and tourism businesses. In addition, increases in flooding, coupled with continued coastal erosion, will have negative impacts on coastal habitats, settlements, and transport infrastructures and also on surrounding agricultural land. Flooding could have an impact on the important fishing tourism industry in Northern Ireland. In addition, increased water temperatures can be lethal to fish such as salmon.

Recommendations to increase understanding of the potential impacts

More specific modelling of the flood risk and potential impacts in Northern Ireland is urgently needed. Any information should then be used to produce a strategy to help prepare the country and the coastal tourism sector to cope with the risks.

In addition, further research needs to focus on which fish species are more valuable to Northern Ireland for both biodiversity and economic reasons, and the potential advantages of new target species in the changing marine climate.

iii) In coastal Scotland: the West Coast, the Minch and the Northern North Sea.

Tourism in Scotland is heavily concentrated in the cities and mountains (Visit Scotland, 2008). However, some of the surrounding islands are also popular. Hill climbing, skiing, golfing holidays and cultural tourism all take place mainly in inland areas. As a result, changes to coastal areas as a result of climate change are unlikely to have significant impacts on these businesses. However, climate change in general, and the resulting warming of the country is likely to result in warmer winters potentially jeopardizing ski tourism and reducing its opportunities for expansion. This could provide an opportunity for coastal areas to further develop their tourism operations. Any changes in the marine climate could also have a positive impact on this development if weather conditions become more favourable.

According to UKCIP, under medium and high emissions scenarios, the sea-surface temperature around Scotland is expected to increase but by not as much as other parts of the UK and there is expected to be lower sea level rise due to variations in natural land movement (Hulme et al., 2002). In addition, future changes in average precipitation are expected to be smallest in northwest Scotland (Hulme et al., 2002). As a result, the Scottish Government's Economic Strategy has identified tourism as one of the key sectors with high growth potential and the capacity to boost Scotland's productivity (Scottish Government, 2007).

Water sports such as kayaking, canoeing, surfing and yachting are very likely to benefit from any increases in summer temperatures and the tourism season is likely to be extended by several months.

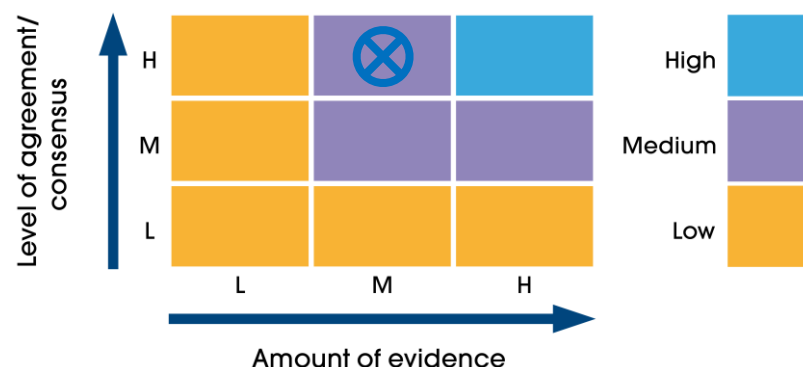
Recommendations to increase understanding of the potential impacts

Warmer summer temperatures will also benefit small coastal towns and islands in Northern Scotland bringing additional economic activity to these locations. Particular attention should be paid to the transport network which is mainly made up of ferry links and coastal roads. They are thought to not currently be vulnerable to coastal erosion or sea level rise. However, increased risks of extreme weather events such as coastal flooding and landslides could cause damage and disruption to fragile island and remote communities who rely on inbound tourism.

The predicted warming of the Scottish continental shelf is thought to be beneficial for certain species of fish. However, no scientific assessment has been undertaken to determine the precise marine climate change impacts on the fish populations and the associated tourism industry.

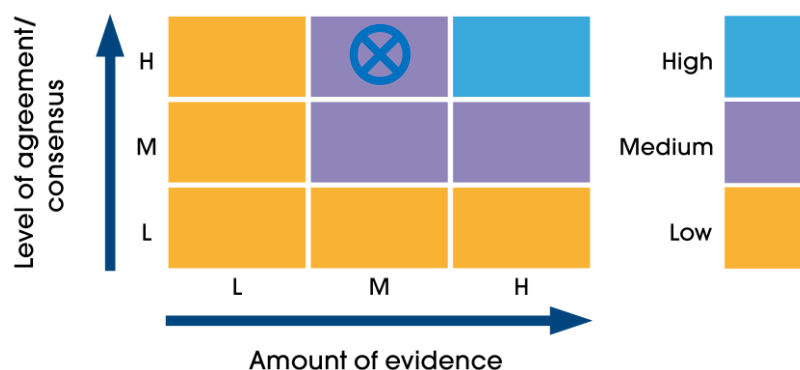
3. Confidence in the science

What is already happening: **Medium**



In the UK, research into the impact of climate change on coastal tourism and the impact on visitor numbers is a relatively recent discipline. However, changes in marine climate have been observed in a significant number of regions and countries. The relationship between climate change and the impacts on marine and coastal tourism is increasingly accepted by the scientific community and there is growing evidence of the general population shifting their tourism preferences in line with changes in climate.

What could happen: **Medium**



Research into the effect of changes in the marine climate and the impacts on tourism is ongoing. Due to uncertainty in the climate predictions and even greater uncertainty in how tourists and the tourism sector will adapt to climate changes, it is not possible to explicitly predict how the tourism sector will be affected. However, several models and research studies all suggest similar impacts which have also started to be observed in some regions and countries of the UK. The UK is expected to have increased numbers of visitors due to the air and sea temperatures become more stable and reliable during the summer months.

4. Knowledge gaps

The top priority knowledge gaps that need to be addressed in the short term to provide better advice to be given to policy makers are:

1. The lack of detailed information on how tourists will respond to climate changes and the potential impacts this may have. There is an assumption that tourism numbers in northern Europe will increase. It can also be assumed that with warmer summers domestic tourists will head to the, traditionally cooler, coastal areas. However, further research is required into visitors' preferences especially relating to the reasons for visiting certain locations.
2. The lack of knowledge on the adaptative capacity of the tourist sites and regions. An assessment of the adaptative capacity of the locations where the tourism sector takes place is essential to identify the vulnerability to marine climate change and develop an efficient action plan and preventive strategy. It will also allow operators to benefit from economic opportunities that may arise.
3. The lack of knowledge on the carrying capacity of tourist sites and attractions. With a predicted increase in visitor numbers and the potential degradation of sites and attractions, either through climate change or tourism, it is important to determine the carrying capacity to better manage tourists and minimize their impacts on the tourism resources and the environment.

5. Socio-economic impacts

The full paper already deals with socio economic and environmental impacts of climate change on tourism and marine recreation.

If the UK experiences milder winters and more reliable summers in line with the current predictions, the tourism season will be extended. This will provide increased opportunities for more year-round employment rather than the traditional seasonal work. However, extreme events may deter visitors and result in significant costs for tourism operators.

6. References

- Amelung, B. and Viner, D. (2006) The sustainability of tourism in the Mediterranean: Exploring the future with the Tourism Climatic Index. *Journal of Sustainable Tourism*, 14 (4), 349-366.
- Arnell, B., Darch, G., and McEntee, P (eds) SNIFFER UK CC13 (2007) Preparing for a Changing Climate in Northern Ireland: summary report. www.doeni.gov.uk/preparing_for_a_climate_change_in_northern_ireland_executive_summary.pdf
- Bigano, Andrea, Gorla, Alessandra, Hamilton, Jacqueline M. and Tol, Richard S. J. (2005) The Effect of Climate Change and Extreme Weather Events on Tourism (February 1, 2005). FEEM Working Paper No. 30.05; CMCC Research Paper No. 01. Available at SSRN: <http://ssrn.com/abstract=673453>. [Accessed 25 June 2010]
- Bresnan, E., L. Fernand, K. Davidson, M. Edwards, S Milligan, R Gowan, J Silke, S Kröger & R Raine (2010) Climate Change impacts on Harmful Algal Blooms (HABs) in MCCIP Annual Report Card 2010-11, MCCIP Science Review, 10pp. www.mccip.org.uk/arc
- Brown, J.M., Souza, A.j., and Wolf, J (n.d.) An 11-year validation of wave-surge modelling in the Irish Sea, using a nested POLCOMS-WAM modelling system. nora.nerc.ac.uk/9032/1/Brownetalomod2010.pdf. [Accessed 26 June 2010]
- Climate Change Risk Management Ltd (CCRM Ltd) (2008) *Climate change in Cornwall: Future Risks*.
- Cumbria Intelligence Observatory (2010) *Cumbria Floods November 2009: An Impact Assessment* www.cumbriaobservatory.org.uk/elibrary/Content/Internet/536/671/4674/4026717419.pdf. [Accessed 25 June 2010]
- Cunningham, S., R. Marsh, R. Wood, C. Wallace, T. Kuhlbrodt, and S. Dye (2010) Atlantic Heat Conveyor (Atlantic Meridional Overturning Circulation) in MCCIP Annual Report Card 2010-11, MCCIP Science Review, 14pp. www.mccip.org.uk/arc
- Department for Environment, Food and Rural Affairs (2005) Charting Progress: An Integrated Assessment of the State of the UK Seas. Defra, London, UK
- European Commission (2010) Survey on the attitudes of Europeans towards tourism, Analytical report, Wave 2.
- EUROSION (2004) *A European initiative for sustainable coastal erosion management*. <http://www.euroSION.org/index.html>. [Accessed 25 June 2010]
- Evans, P.G., I.L. Boyd, C.D. MacLeod (2010) Impacts of Climate Change on Marine Mammals in MCCIP Annual Report Card 2010-11, MCCIP Science Review, 14pp. www.mccip.org.uk/arc
- Fealy, R., Sweeney, J., Murphy, C., and McElwain, L (2006) *The Isle of Man Climate Change Scoping Study: Climate Indicators for acclimatise and the Department of Local Government and the Environment, Isle of Man Government*. www.gov.im/lib/docs/dlge/3climateindicatorsfinal.pdf. [Accessed 26 June 2010]
- Firth, J. and Hutchins, A. (2006) *The Isle of Man Climate Change Scoping Study. Acclimateise*, Southwell. www.gov.im/lib/docs/dlge/enviro/executivesummaryfinalv2.pdf [Accessed 26 June 2010].

- Fish, P. and R. Moore. (2005) *Climate change impacts on coastal cliffs: accessing and using meaningful data*, Presentation at the CLIFFS Meeting, Loughborough University, October 2005. www.cliffs.lboro.ac.uk [Accessed 25 August 2008]
- Gössling, S., Bredberg, M., Randow, A., Svensson, P., and Swedlin, E. (2006) Tourist perceptions of climate change: a study of international tourists in Zanzibar. *Current Issues in Tourism*, **9**(4-5), 419-435.
- Hulme, M., Jenkins, G.J., Lu, X., Turnpenny, J.R., Mitchell, T.D., Jones, R.G., Lowe, J., Murphy, J.M., Hassell, D., Boorman, P., McDonald, R., and Hill, S. (2002) *Climate change scenarios for the United Kingdom: The UKCIP02 Scientific Report*. Tyndall Centre for Climate Change Research, School of Environmental Science, University of East Anglia, Norwich, UK. 120pp.
- Intergovernmental Panel on Climate Change (IPCC) (2007) *A contribution of working groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. www.ipcc.ch
- Isle of Man Government (2010a) www.gov.im/isleofman/economic.xml [Accessed 26 June 2010]
- Isle of Man Government (2010b) *Vision 2020: Isle of Man Tourism Strategy*. www.gov.im/tourism/trade/strategy.xml. [Accessed 26 June 2010]
- Jenkins, G.C., Perry, M.C. and Prior, M.J.O (2007) *The climate of the United Kingdom and recent trends*. Met Office Hadley Centre, Exeter, UK.
- Murphy, J., Sexton, D., Jenkins, G., Boorman, P., Booth, B., Brown, K., Clark, R., Collins, M., Harris, G. and Kendon, L. (2009) *UK Climate Projections science report: Climate change projections*. Met Office Hadley Centre. ukclimateprojections.defra.gov.uk/. [Accessed 22 June 2009].
- Northern Ireland Tourist Board (NITB) (2007) *Tourism visitor and domestic holiday attitude survey 2007* www.nitb.com/Filehandler.ashx?id=595. [Accessed 26 June 2010]
- Northern Ireland Tourist Board (2008) *Visitor Attractions Survey* <http://www.nitb.com/CategoryPage.aspx?path=2e3c2831-b6cb-4bcd-a276-e0283e5bd203,7d900211-b5e0-4238-ae9d-7a0470e3517f,b210892b-3fce-40a9-b0d9-31b7d7d22106>. [Accessed 26 June 2010].
- Northern Ireland Tourist Board (2009) *Tourism Barometer Wave 3*. www.nitb.com/CategoryPage.aspx?path=2e3c2831-b6cb-4bcd-a276-e0283e5bd203,76feeab2-495b-4951-8e1a-f26d64d3fca4,b12cb1ef-7667-4c03-9e89-6e45ff52c444. [Accessed 26 June 2010]
- Office for National Statistics (2009) *Travel Trends 2008: Data and Commentary from the International Passenger Survey*. www.statistics.gov.uk/downloads/theme_transport/Travel_Trends_2008.pdf [Accessed 25 June 2010]
- Scottish Government (2007) *The Government Economic Strategy*. www.scotland.gov.uk/Resource/Doc/202993/0054092.pdf. [Accessed 26 June 2010]
- Sea Watch Foundation (n.d.) *Threats to UK cetaceans*. www.seawatchfoundation.org.uk/docs/Threats%20to%20UK%20cetaceans.pdf. [Accessed 26 June 2010]
- South West Climate Change Impacts Partnership (SWCCIP) and South East Climate Change Partnership (2003) *Climate change and tourism in the south of England*.
- Viner D., Agnew M., University of East Anglia, WWF-UK (1999) *Climate Change and Its Impacts on Tourism*
- Visit Britain (2009) *Activities undertaken by visitors from overseas in the nations and regions of the UK*. www.visitbritain.org/Images/Activities%20by%20Nation%20and%20Region_tcm139-167960.pdf. [Accessed 25 June 2010]
- Visit England (2009) *Visitor Attractions Trends in England 2008*. www.enjoyengland.com/Images/Annual%20Visits%20to%20Visitor%20Attractions%20Survey%202008%20-%20Final%20Report_tcm21-172083.doc. [Accessed 25 June 2010]
- Visit Scotland (2008) *Visit Scotland Research* www.visitscotland.org/research_and_statistics/tourism_statistics/national_facts_and_figures.aspx. [Accessed 25 June 2010.]

Wales Tourist Board (2000) *Achieving our potential: a tourism strategy for Wales*
wales.gov.uk/depc/publications/tourism/aboutvisitwales/stratpol/aop/achievingpotential.pdf?lang=en. [Accessed 25 June 2010]

Welsh Assembly Government (2007) *A progressive agenda for the Government of Wales*
<http://wales.gov.uk/strategy/strategies/onewales/onewalese.pdf?lang=en>. [Accessed 25 June 2010.]

Websites:

VisitBritain. Statistics, annual reports and other documents;
www.visitbritain.co.uk/

Northern Ireland Government, Government Departments.
www.northernireland.gov.uk/index/gov.htm [date of access: 03/2010]

Northern Ireland Tourist Board
www.nitb.com/ [date of access: 03/2010]

The Welsh Assembly Government, Topics (Statistics, Tourism, Sustainable Development)
wales.gov.uk [date of access: 03/2010]

VisitWales, activity listings and other documents.
www.visitwales.co.uk [date of access: 03/2010]

Scottish Government, Topics (Statistics, Environment, Tourism, Marine and Fisheries)
www.scotland.gov.uk/Topics [date of access: 03/2010]

VisitScotland. Activity listing and other documents.
www.visitscotland.com [date of access: 03/2010]