

IMPACTS OF CLIMATE CHANGE ON TOURISM

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Executive Summary

It has been known anecdotally for some time that tourism is controlled by climate, in terms of the climate of the source and destination countries of these tourists. It has also been well documented that at local, regional and global scales tourism is a significant industry for which forecasts show increasing growth. By use of the [Tourism Comfort Index](#) we can ascertain that the Mediterranean has, up until now, been the location with the most suitable climate for tourism (in terms of the TCI). As a result of climate change this is now changing. We are seeing an increase in the frequency of months where the TCI is more suitable in North West Europe than the Mediterranean. As a result of the increasing suitability of NW Europe for tourism it can be expected that there will be an increase in tourism activity around the coastal zone. Couple this to changing demographics and socio-economic conditions and it is increasingly likely that the marine environment will be subjected enhanced pressures by tourism activity. This enhanced pressure will come in the form of: increased visitor numbers to the coastal zone; longer tourism season; increased tourism infrastructure (i.e. Hotels, attractions, marinas) increased waste (i.e. Sewage, solid waste); and increased environmental destruction.

Level of Confidence

We have a high level of confidence that the TCI is changing and producing more favourable conditions for tourism in North West Europe and decreasingly favourable conditions in southern Europe during the summer months. The Change in TCI in both cases is predominantly driven by increasing temperatures.

There are low levels of confidence in changes in the socio-economic conditions that will accompany an increasingly favourable climate for tourism.

Key Sources of Information

Pinnegar, J.K., Viner D., Hadley D., Dye S., Harris M., Berkhout F. and Simpson M., (2006) Alternative future scenarios for marine ecosystems. Technical Report. CEFAS, Lowestoft 109pp

Viner D., Sayer M., Uyarra M., and Hodgson N., (2006) Climate Change and the European Countryside: Impacts on Land Management and Response Strategies. Report Prepared for the Country Land and Business Association., UK. Publ., CLA, UK 180 pages.

Amelung B. and Viner D. (2006) The sustainability of tourism in the Mediterranean: Exploring the future with the Tourism Comfort Index Journal of Sustainable Tourism Vol 14 Nos. 4

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Supporting Evidence

It has been known anecdotally for some time that tourism is controlled by climate, in terms of the climate of the source and destination countries of these tourists. It has also been well documented that at local, regional and global scales tourism is a significant industry for which forecasts show increasing growth. A large share of international tourism is determined by climate factors, such as temperature and sunshine, which often exhibit considerable seasonal variability. The 'triple-S' of sun, sea, and sand is widely viewed as an important success factor of destinations. This can be seen repeatedly in tourism brochures and other PR material. The proof for this central position of climate, however, is not merely anecdotal. Statistical analyses by Maddison (2001), Lise and Tol (2002), and Hamilton (2003), and a simulation study by Hamilton *et al.*, (2003) show the relevance of climatic factors as determinants of tourist demand.

The climate and environment of a resort has been regarded (at least by the traditional tourism research community) as fixed. Increasingly there is evidence to suggest that climate change will start to impact upon the suitability of tourist destinations, either through the direct impacts of climate change or by altering the perception of tourists (Lise and Tol, 2002, Amelung and Viner 2006).

Agnew and Viner (2001) explored the impacts of climate change on a range of different destinations; this was the first definitive attempt to examine the multi-sectoral and global changes in tourism flows as a result of climate change. Viner and Amelung (2003) report on the wider issues that surround the interactions of climate change with tourism and the environment. Mather *et al.* (2005) take this approach further and examine the policy responses required to address the impacts of climate change on tourism, and tourism on the climate system.

The predominant destination for UK tourists (and others from Northern Europe) is the Mediterranean. The majority of tourist resorts are located on the coastal fringes of this region, which are particularly vulnerable to climate change, through sea-level rise and changing temperatures. The systematic study of the effects of climate change on tourism patterns has started only recently, although a collection of more-or-less isolated studies existed beforehand. The effects of climate change on the Mediterranean area are among the most studied. Perry (2000) addressed the implications for the Mediterranean region; this concludes that increases in summer temperatures may produce an unsuitable climate, a situation aggravated by an increased risk of droughts.

By using a Tourism Comfort Index (TCI) as described by Amelung and Viner (2006) we are starting to see a decline in the suitability of the Mediterranean for tourism during the productive summer season while in parallel the suitability for tourism of the source countries in northern Europe improves. The use of the TCI may be subject to argument, but it does, however, provide a unique indicator for the assessment of climate change impacts on tourism at a regional scale. The European heatwave of 2003 provided for the first time an indication of a climate event that can be attributable to climate change (Schar, 2004); there does need to be, however, a quantitative assessment to support anecdotal evidence that the tourism industry across Europe was impacted. Jenkins *et al.*, (In Press)

showed that over 60% of tourism businesses in Torbay have already been affected by climatic events, for instance, changing seasonality.

It is likely that the simultaneous changes in demand and supply will open up new possibilities for tourism development in some areas and close down options in others. Prognoses for the shoulder seasons of spring and autumn are more favourable, however, indicating a potential shift from the summer season towards the shoulder season. Such a shift would have profound economic, social and ecological impacts. For example, an estimated 100 million tourists visit the Mediterranean region on an annual basis, spending close to 100 billion dollars (Viner and Nicholls, 2006), employing millions of people, and using a lot of water and energy.

The broad impacts of the decline in suitability of the Mediterranean during the 21st Century and the increasing suitability of Northern European Zones for tourism, were summarised in Pinnegar *et al.*, (2006) and Viner *et al.*, (2006):

- Decline in the numbers of UK outbound tourists visiting the Mediterranean during the summer months;
- Increase in domestic tourism within the UK;
- Increase in overseas tourists visiting Britain during the summer months for coastal (sun, sea, sand) tourism;
- Increasing pressures on the coastal zones and waters of the UK.

Associated with the direct impacts of increased visitor numbers, there will also be a range of indirect impacts:

- Increased tourism infrastructure;
- Increase used of the coastal waters for recreation and tourism;
- Increased use of inland water resources and waste, which will add pressures on the marine environment;

Other key impacts associated with climate change might include:

- Coastal squeeze of beaches behind hard defences as sea level rises causing erosion and removing the beaches that tourists want to visit.
- Loss of infrastructure for tourism due to sea level rise or a high replacement/maintenance cost if storminess increases.
- Changing rainfall patterns (not very predictable as yet) that could lead to water supply issues (if it becomes very dry in summer).

In order to adapt, some of the tourism industry may need to refocus in the future.

Overall the potentially rapid expansion of tourism is likely to produce increasing pressures on the marine environment. The understanding of the quantitative nature of the interactions that exist between climate change, the marine environment and tourism is still in its early stages (Viner, 2006) and further research (some underway) is required.

Please acknowledge this document as: Viner, D. (2006). Impacts of Climate Change on Tourism *in*

References and further reading

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Interactions. Proceedings of the ESF-LESC Workshop, Milan 4-6th June Publ. eCLAT, Climatic Research Unit, Norwich, UK 2003. 63pp

Further Information Sources

Climate Change and Tourism Web Site

www.e-clat.org

The AFMEC scenarios

<http://www.cefas.co.uk/marine-futures/default.htm>