



Climate Change and Tourism

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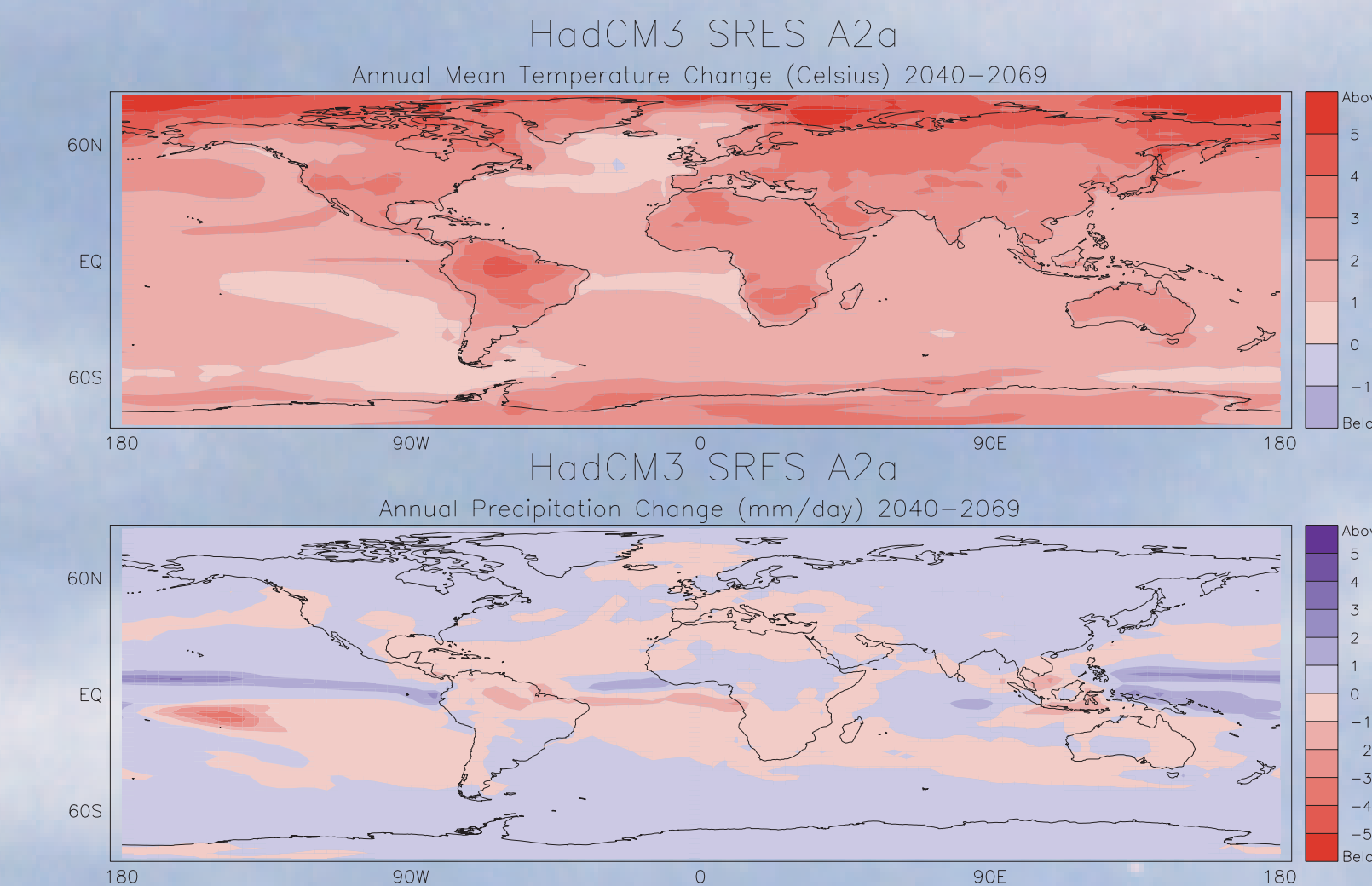
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Introduction

This poster summarises a report commissioned by the World Wide Fund for Nature (WWF-UK) and a paper prepared for the *International Conference on Tourism and Hospitality in the 21st Century* (11-14th January, 2000, University of Surrey). These publications review the impacts of climate change for a wide range of international holiday destinations visited by UK tourists.

The impacts of climate change on tourism are likely to manifest themselves in a number of different ways according to local conditions. The most serious impacts will result from the effects of sea-level rise on small island states and low lying coastal resorts. The Maldives and Florida, which are an increasingly popular tourist destinations, are seen as being particularly vulnerable to sea-level rise.

Climate change is expected to increase the risk of illness in several parts of the world and consequently discourage tourism. More frequent periods of extreme heat will cause discomfort in many resorts of the Eastern Mediterranean, where the number of days above 40°C is estimated to increase and Malaria has the potential to re-emerge in the Iberian Peninsula.



Estimated changes with respect to the 1961-90 average in mean-temperature (top) and mean precipitation mm/day (bottom) for the 2050s. These are constructed from the results of a climate change integration performed with the coupled ocean-atmosphere model HadCM3 which has been forced with observed forcing for the period 1860-1990 and the IPCC SRES A2 emissions scenario. Results from this integration and others can be obtained from the Climate Impacts LINK Project <http://www.cru.uea.ac.uk/link>.

Winter tourism is likely also be affected, as the Alps and other skiing destinations experience less snowfall and shorter skiing seasons. These impacts will be especially pronounced in the lower-lying ski resorts, such as Garmish-Partenkirchen, Germany, and those resorts, such as in the Scottish Highlands.

Background

International tourism is the largest and most rapidly expanding economic activity in the world today. As reported by the World Tourism Organisation, travel and tourism involved 625 million people internationally and generated \$US 445 billion in receipts in 1998 (WTO, 1999). The global tourism industry is expected to grow significantly in the future as personal incomes and leisure time increase, and transportation networks improve.

The climate system is dynamic and varies on all time scales. However, over the last century we have seen an increase of over 0.6°C in the average temperature of the Earth. The warming this century has been more rapid than any other period for which we have data and the 1990s will be the warmest decade this millennium. Detailed analysis of the output from climate models provide further evidence of the impacts of the enhanced 'greenhouse' effect upon our climate. Extreme climate events (such as droughts and prolonged 'hot' periods) are likely to increase in frequency. For example we have seen in the Eastern Mediterranean in the summer of 2000 temperatures reaching record levels.

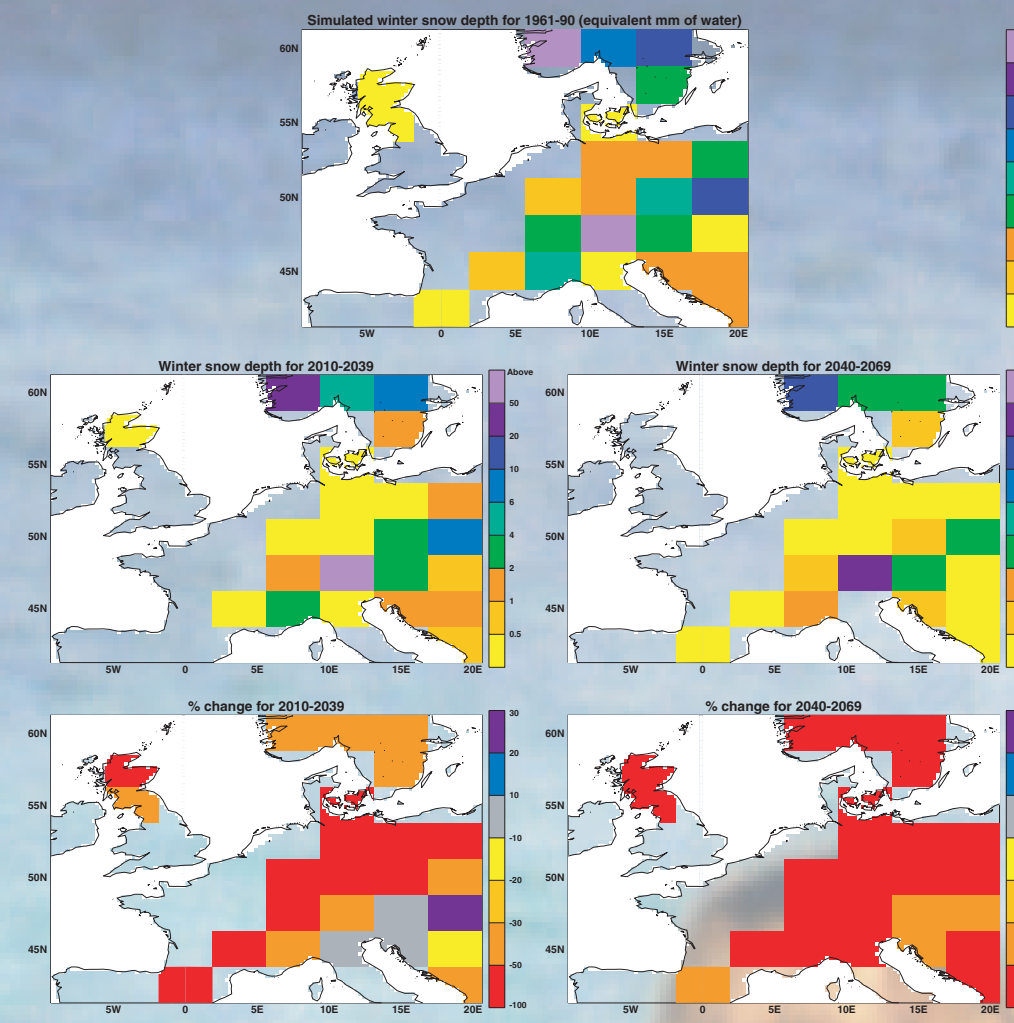
Case Studies

For the original report for WWF-UK, we reviewed existing literature and undertook new analyses the future potential impacts for ten tourist destinations:

- Maldives
- European Alps
- Eastern Mediterranean
- Southern Spain
- Scotland
- European Lakes
- East and S. Africa
- Australia
- Florida and S. E. USA Coastline
- Brazil



Sea-level rise will impact on many low lying regions and coastal resorts.



Evolution of snow cover for the European region as estimated by the HadCM2GGa1 integration

The Maldives

Environment and Climate:

Many of the islands are less than 1 metre above sea level
Globally, sea levels are estimated to rise at a rate of 4-10cm per decade

Tourism:

Tourism is the backbone of the Maldives' economy (~18% GDP)
The coral reefs and beaches are the dominant tourist attraction

Potential impacts:

- Impacts of sea level rise:
 - Coastal erosion
 - Salt-water intrusion
 - Large percentage of land could be lost over the next 20-50 years
- Impacts of increase in sea temperatures:
 - Coral bleaching likely to be induced by an SST warming of 1-2°C
 - The cost of losing 58% of world's coral reefs estimated as \$140 billion



The resorts and regions were chosen for a range of reasons, they are popular with British tourists (e.g. Southern Spain), they are expected to be vulnerable (e.g. the Maldives), they encompass many different sectors of the tourism industry (e.g. Australia). These destinations also cover a wide stakeholder community and are geographically distributed.



Estimates of reduced cloud cover for Australia and other regions will increase the risks of exposure to UV radiation

For the purpose of this poster we will present three case studies: the Maldives, Australia and the Mediterranean.

Australia

Environment and Climate

Results from climate change experiments indicate:
a summer temperature increase of over 1.5°C by 2020s and 3-4°C by 2050s;
a reduction in cloud cover of 10-15% by 2050s and a related reduction in rainfall of 10-20%

Tourism

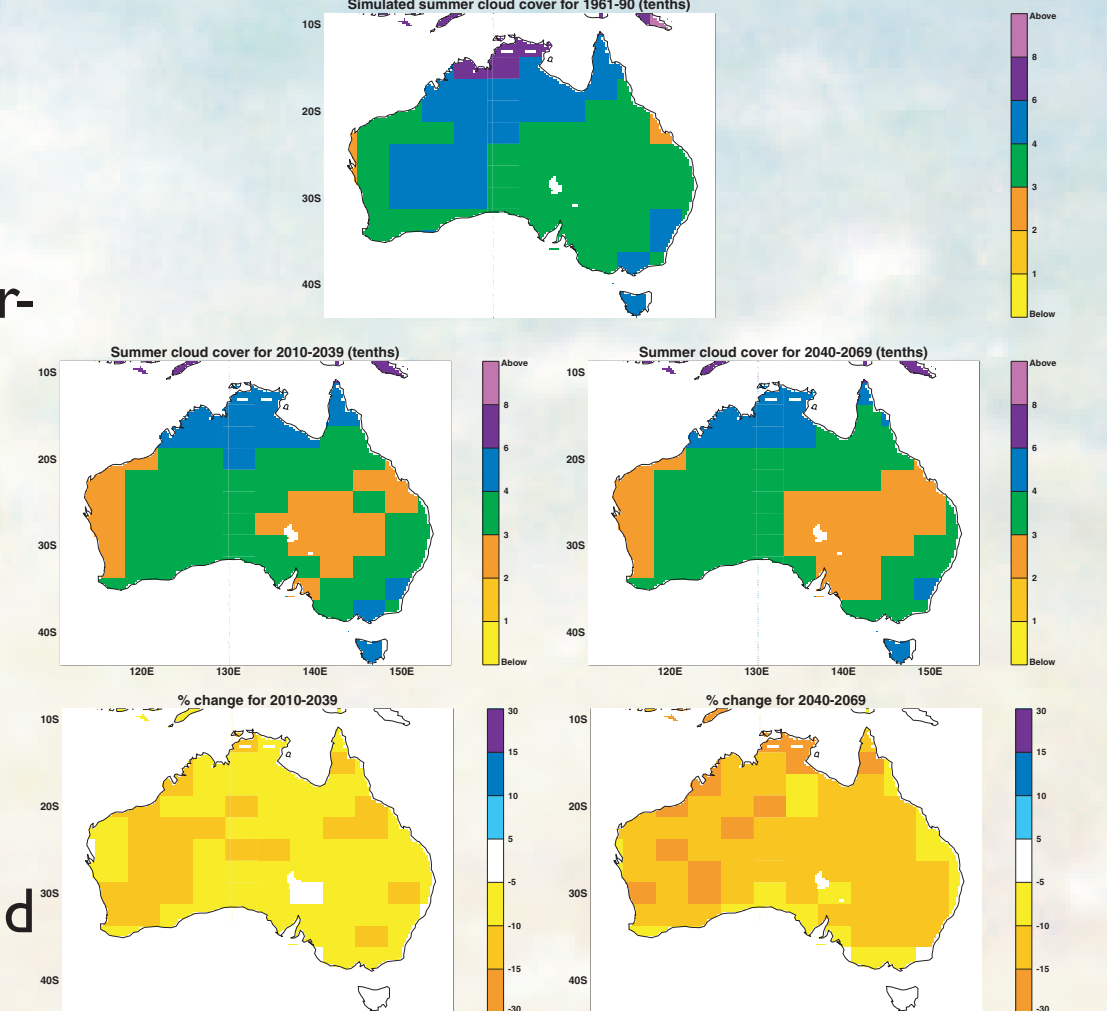
Main outdoor tourist attractions: Great Barrier Reef, winter sports in the Australian Alps, water-based activities
It is estimated that the Great Barrier Reef generates over \$1.5 billion annually



Potential impacts

- Shortening of skiing season, up to 66% reduction by 2030.
- Increased potential for transmission of mosquito-borne diseases.
- Increased exposure to UV radiation
- Inundation of estuarine and wetland areas through sea-level rise and increased impact of storm surges
- Severe damage of Great Barrier Reef caused by 'coral bleaching' within the next 20-40 years.

Evolution of summer (DJF) cloud cover for Australia as estimated by the HadCM2GGa1 integration.



Stakeholders and Partners

The stakeholder community of the tourism industry is fragmented, with different sectors experiencing varying degrees of exposure to climate change and therefore, requiring wide-ranging adaptive and mitigative responses. The broad communities of stakeholders within the tourism industry can be identified as:

- The individual tourists**
- The service providers** - travel agents, tour operators, insurance companies, health companies
- The transport sector** - airlines, airport authorities, rail companies, ferry companies, car rentals
- The destination resorts** - regional governments, tourism boards, local planning authorities, hoteliers, resort developers.
- Trade Associations** - e.g., ABTA, World Tourism Trade Council

Each of these stakeholder communities will have a different level of flexibility in response to climate change. Some may view climate change as an opportunity to adapt and diversify, others may be forced to adapt or enact mitigation strategies, depending on external and local pressures (such as the rate of climate change and local impacts and responses). For example, mitigation and adaptation policies (internal and external) will be important for the transport sector.

Air transport is the fastest growing source of greenhouse gas emissions, and emissions from road transport are already considerable.



Precautionary adaptive measures such as reducing exposure to UV radiation will minimise health impacts

Southern Iberia and the Eastern Mediterranean.

Environment and Climate

Currently an attractive climate: year-round warmth and sunshine
Models indicate an increase in summer temperatures with no significant change in precipitation.
Present day maximum temperatures can exceed 40°C

For Turkey climate models suggest mean summer temperature increase will be in excess of 4°C by the middle of the next century, exceeding several thresholds of human comfort.

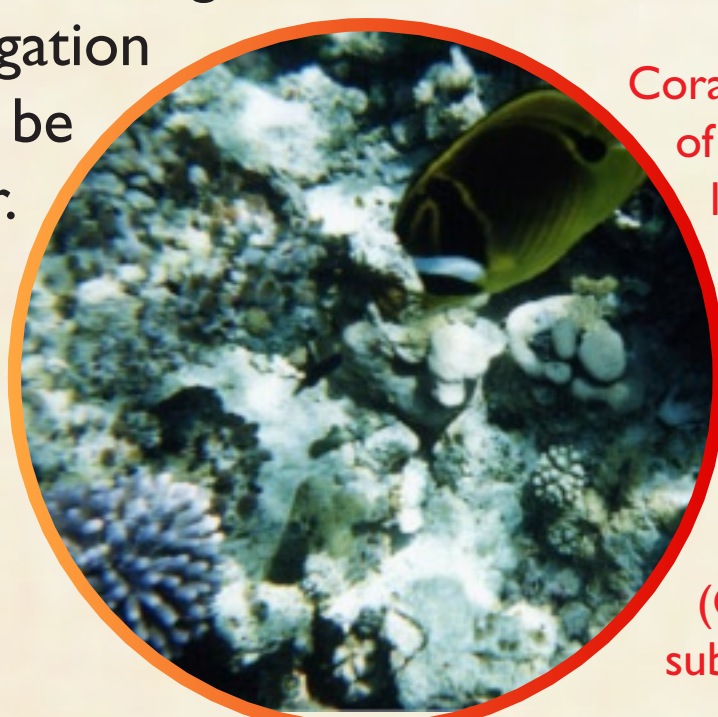
Tourism

Tourism is regarded as a key economic sector
Major destination for UK holiday makers.

Potential impacts

- Warming trend: region may become a more suitable habitat for certain species of mosquito and increase the incidence of malaria.
- Forest fires already constitute a serious problem, the situation is likely to worsen.
- Increase in extreme weather events causing flash floods and incidents of heat-stress.
- Tourists change timing of visits to avoid hottest months or switch to alternative destinations.

Coral bleaching affects the biodiversity of coral-reef systems. For some locations the reefs are the principle tourist attraction. For others the reefs are a major source of revenue and natural sea defence mechanism. Increasing sea temperatures will increase the frequency of coral bleaching events (Guldberg, 1999) and thus lead to subsequent long term degradation.



Reports and Papers
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WWF-UK Tourism: Facing the Challenge of Climate Change Publ. 20pp
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Further Reading and References