Adaptation to Climate Change in the Tourism Sector
“It is vital for tourism destinations [...] to anticipate the coming changes and to draw their consequences, starting now. [Adaptation] is a long-term project that must be anticipated and carefully prepared beforehand; it is not easy to see this through successfully, because it entails, all at the same time, modifying economic circuits, introducing new technologies, carrying out intensive training, investing in the creation of new products, [...] changing the minds of public authorities, entrepreneurs, host communities and tourists.”

Francesco Frangialli, UNWTO Secretary-General, 2007

Climate Change – A Priority Field for Policies and Actions for UNWTO

The World Tourism Organization¹ (UNWTO) is the UN Specialised Agency on tourism and plays a central and decisive role in promoting the development of responsible, sustainable and universally accessible tourism, paying particular attention to the interests of developing countries. With its headquarters in Madrid, UNWTO carries out extensive research, capacity building and technical assistance activities, advocating for sustainable development of tourism in international and national policy processes, with climate change dealt with as priority issue.

¹ www.unwto.org
Adaptation to Climate Change in the Tourism Sector

UNWTO has a specific focus on adaptation, considering that tourism is a highly climate-dependent economic sector that is vulnerable to the direct and indirect impacts of climate variability and change. The organization recognises that tourism contributes to global warming, and that at the same time the tourism industry needs to develop its potential to adapt to global warming.

Partners for collaborative actions in adaptation: UNFCCC and its Nairobi Work Programme, UNEP, WMO, UNDP, WEF and IPCC.

Policy making and awareness raising: At the Davos Conference special sessions were dedicated to climate change adaptation at different types of vulnerable destinations (coasts and islands, mountain regions and nature-based destinations). The Davos Declaration acknowledges the need to adapt to changing climate conditions and calls for specific actions by different tourism stakeholders. UNWTO also made special contributions to the IPCC Fourth Assessment Report through review of its Working Group II regarding the interrelation between tourism and climate change adaptation.

Enhancing the technical knowledge base and building capacity: The Report on Climate Change and Tourism - Responding to Global Challenges, commissioned by UNWTO, UNEP and WMO, provides a synthesis of the state of knowledge about current and likely future impacts of climate change on tourism destinations around the world, and an overview of policy and management responses of adaptation to climate change.

Through the Davos Process, UNWTO focuses on policy implementation and practical applications in the tourism sector, as well as their dissemination through seminars, workshops, publications and meetings with tourism stakeholders. The guidebook on “Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices” published in conjunction with an applied training seminar, organized with UNEP and Oxford University, provides tools for increasing adaptive capacity including tailoring adaptation processes to the tourism sector.

**Implementing adaptation measures and disseminating good practices:** UNWTO is assisting the integration of tourism, also as a means of economic diversification, into national adaptation strategies through pilot projects in Small Island Developing States. Currently, in preparation for the World Climate Conference (WCC-3), UNWTO is the lead agency for the organization of a parallel session on climate information for risk management and adaptation in the tourism sector. UNWTO set up a special web-portal on climate change and tourism ([www.unwto.org/climate](http://www.unwto.org/climate)) and established recently a knowledge-exchange mechanism for applied climate solutions in the tourism sector ([www.climatesolutions.travel](http://www.climatesolutions.travel)).

### Key publications

- **Davos Report (2008)**

### The Tourism Sector needs to adapt to a wide range of impacts related to climate change

The tourism industry and destinations are clearly sensitive to climate variability and change. Climate defines the length and quality of tourism seasons and plays a major role in destination choice and tourist spending. In many destinations tourism is closely linked with the natural environment. Climate affects a wide range of the environmental resources that are critical attractions for tourism, such as snow conditions, wildlife productivity and biodiversity, water levels and quality. Climate also has an important influence on environmental conditions that can deter tourists, including infectious disease, wildfires, insect or water-borne pests (e.g., jellyfish, algae blooms), and extreme events such as tropical cyclones.

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There are four broad categories of climate change impacts that will affect tourism destinations, their competitiveness and sustainability:

1. **Direct climatic impacts**
   - Warmer Summer
   - Warmer winters
   - Precipitation change (water supply)
   - Increased extreme events

2. **Indirect environmental change impacts**
   - Biodiversity loss (terrestrial and marine)
   - Sea Level Rise
   - Disease

3. **Impact of mitigation policies on tourist mobility**
   - Travel costs and destination choice (less long haul?/less plane?)

4. **Indirect societal change impacts**
   - Global/regional economic impacts
   - Increase security risks (social/governance disruption)

**Destination vulnerability hotspots:** The integrated effects of climate change will have far-reaching consequences for tourism businesses and destinations. Importantly, climate change will generate both negative and positive impacts in the tourism sector and these impacts will vary substantially by market.
segment and geographic region. The implications of climate change for any tourism business or destination will also partially depend on the impacts on its competitors.

A negative impact in one part of the tourism system may constitute an opportunity elsewhere. Consequently, there will be ‘winners and losers’ at the business, destination and nation level. The figure below provides a summary assessment of the most at-risk tourism destinations for the mid- to late-21st century. Due to the very limited information available on the potential impacts of climate change in some tourism regions, this qualitative assessment must also be considered with caution. Until systematic regional level assessments are conducted a definitive statement on the net economic or social impacts in the tourism sector will not be possible. Furthermore, the outcome most likely will depend on the extent of climate change. The impact on the tourism sector may strongly parallel that of the global economy, where a 1°C temperature rise may result in a net benefit for the world economy, but greater increases increasingly show net declines.

It is now recognised that regardless of the emissions reduction efforts, there is an inevitable need for societies around the world to adapt to unavoidable changes in climate. It is essential to emphasize that regardless of the nature and magnitude of climate change impacts, all tourism businesses and destinations will need to adapt to climate change in order to minimize associated risks and capitalize upon new opportunities, in an economically, socially and environmentally sustainable manner.

Relative adaptive capacity of major tourism sub-sectors

![Diagram](image)

Source: Scott, D. and Jones, B. (2006): Climate Change and Seasonality in Canadian Outdoor Recreation and Tourism

Tourists have the greatest adaptive capacity (depending on three key resources: money, knowledge and time) with relative freedom to avoid destinations impacted by climate change or shifting the timing of travel to avoid unfavourable climate conditions (see figure below). Suppliers of tourism services and tourism operators at specific destinations have less adaptive capacity. Large tour operators, who do not own the infrastructure, are in a better position to adapt to changes at destinations because they can respond to clients demands and provide information to influence clients’ travel choices. Destination communities and tourism operators with large investment in immobile capital assets (e.g., hotel, resort complex, marina or casino) have the least adaptive capacity.

The dynamic nature of the tourism industry and its ability to cope with a range of recent major shocks, including SARS, terrorism attacks in a number of nations, or the Asian tsunami, suggests a relatively high adaptive capacity within the tourism industry overall. The capacity to adapt to climate change is thought to vary substantially between sub-sectors, destinations, and individual businesses within the tourism industry. UNWTO especially supports destinations in developing countries to cope with increasing impacts of climate change, in pursuit with the Millennium Development Goals.

Climate Change adaptation can only be effective with the participation of all stakeholder groups. There is a broad range of options available (see table).
Portfolio of climate adaptations utilized by tourism stakeholders

<table>
<thead>
<tr>
<th>Type of adaptation</th>
<th>Tourism operators / businesses</th>
<th>Tourism industry associations</th>
<th>Governments and communities</th>
<th>Financial sector (investors/insurers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>Snow-making</td>
<td>Enable access to early warning equipment (e.g. radios) to tourism operators</td>
<td>Reservoirs and desalination plants</td>
<td>Require advanced building design or material (fire resistant) standards for insurance</td>
</tr>
<tr>
<td></td>
<td>Slope contouring</td>
<td>Develop websites with practical information on adaptation measures</td>
<td>Free structures for water consumption</td>
<td>Provide information material to customers</td>
</tr>
<tr>
<td></td>
<td>Rainwater collection and water recycling systems</td>
<td></td>
<td>Weather forecasting and early warning systems</td>
<td></td>
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<tr>
<td></td>
<td>Cyclone-proof building design and structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managerial</td>
<td>Water conservation plans</td>
<td>Snow conditions reports through the media</td>
<td>Impact management plans (e.g. ‘Coral Bleaching Response Plan’)</td>
<td>Adjust insurance premium or not renew insurance policies</td>
</tr>
<tr>
<td></td>
<td>Low season closures</td>
<td>Use of short-term seasonal forecast for the planning of marketing activities</td>
<td>Convention/ event interruption insurance</td>
<td>Restrict lending to high risk business operations</td>
</tr>
<tr>
<td></td>
<td>Product and market diversification</td>
<td></td>
<td>Business subsidies (e.g. insurance or energy cost)</td>
<td></td>
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<tr>
<td></td>
<td>Regional diversification in business operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Redirect clients away from impacted destinations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy</td>
<td>Hurricane interruption guarantees</td>
<td>Coordinated political lobbying for GHG emission reductions and adaptation mainstreaming</td>
<td>Coastal management plans and set back requirements</td>
<td>Consideration of climate change in credit risk and project finance assessments</td>
</tr>
<tr>
<td></td>
<td>Comply with regulation (e.g. building code)</td>
<td>Seek funding to implement adaptation projects</td>
<td>Building design standards (e.g. for hurricane force winds)</td>
<td></td>
</tr>
<tr>
<td>Research</td>
<td>Site Location(e.g. north facing slopes, higher elevations for ski areas)</td>
<td>Assess awareness of businesses and tourist, as well as knowledge gaps</td>
<td>Monitoring programs (e.g. predict bleaching or avalanche risk, beach water quality)</td>
<td>Extreme event risk exposure</td>
</tr>
<tr>
<td>Education</td>
<td>Water conservation education for employees and guests</td>
<td>Public education campaign (e.g. ‘Keep Winter Cool’)</td>
<td>Water conservation campaigns</td>
<td>Educate/inform potential and existing customers</td>
</tr>
<tr>
<td></td>
<td>Water conservation initiatives</td>
<td></td>
<td>Campaigns on the dangers of UV radiation</td>
<td></td>
</tr>
<tr>
<td>Behavioural</td>
<td>Real-time webcams of snow conditions</td>
<td>GHG emission offset programs</td>
<td>Extreme event recovery marketing</td>
<td>Good practice in-house</td>
</tr>
<tr>
<td></td>
<td>GHG emission offset programs</td>
<td>Water conservation initiatives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: UNWTO/UNEP (2006): Climate Change and Tourism – Responding to Global Challenges
Adaptation Responses in Specific Types of Destinations

The following conclusions have been derived from presentations delivered by panellists representing public and private sector, NGOs and research institutions, and the subsequent interventions and debates involving the audience at the Second International Conference on Climate Change and Tourism, held in Davos, Switzerland, 1–3 October 2007.

COASTAL AND ISLAND DESTINATIONS

Conclusions:
Beach tourism remains the dominating market segment, constituting a key part of the economy of most SIDS and developing countries.

Coastal and island destinations are highly vulnerable to direct and indirect impacts of climate change (such as storms and extreme climatic events, coastal erosion, physical damage to infrastructure, sea-level rise, flooding, water shortages and water contamination), given that most infrastructure is located within short distance of the shoreline. This high vulnerability often couples with a low adaptive capacity, especially in SIDS and coastal destinations of developing countries.

The strong seasonality of beach tourism has to be taken into consideration, as it can be exacerbated by climate change. In many beach destinations the high tourist season coincides with low water regimes in dry seasons, aggravating water management and environmental issues.

Many coastal destinations and most SIDS depend on long-haul flights for their tourism-driven economies. Mitigation policies should be developed in a way that do not jeopardise the tourism sector of these destinations.

Destinations specific recommended measures:

- ‘Soft’ coastal protection to prevent erosion (e.g., reforestation of mangroves, reef protection);
- integration of climate change factors Environmental Impact Assessment for coastal infrastructure and establishments;
- implementation of tourism development plans within the framework of Integrated Coastal Zone Management (ICZM) and spatial planning;
- enhancing resilience of coastal ecosystems (e.g. reef conservation through dive tourism, waste management, water conservation techniques; improved drainage and watershed management);
- diversification of beach tourism (promotion of shoulder seasons, cultural tourism, inclusion of inland areas and attractions in programmes).
PILOT PROJECTS IN SMALL ISLAND DEVELOPING STATES – Integration of Tourism into National Adaptation Strategies

Considering the high dependency of many SIDS on tourism and their high vulnerability to climate change coupled with relatively low adaptation capacity, UNWTO initiated a series of pilot adaptation projects at island destinations. Funded by the Global Environmental Facility, activities have been undertaken in Fiji and the Maldives, in collaboration with UNDP and UNEP. The pilot projects are expected to deliver replicable outputs, considering that SIDS and other coastal destinations have similar challenges regarding climate change, such as shoreline and beach erosion, extreme climatic events (cyclones, storm surges, droughts), reduced water availability, degradation of coastal and marine ecosystems, among others.

The projects address policy issues, such as improved inter-ministerial coordination, streamlined regulations and environmental impact assessment processes, improvement of climate information for long term strategic tourism planning, as well as seasonal and short term operations and activities. They intend to implement on-the-ground measures at selected demonstration areas, addressing erosion control, water conservation and waste management, preservation of reef areas and coastal ecosystems, health issues, product diversification, among others. The projects have important capacity building components, targeting tourism operations and environmental managers, local communities, as well as building curricula in educational institutions.

Focus on integrated approaches: the projects deal with tourism facilities, operations and neighbouring local communities, as well as community-based tourism activities in an integrated way, recognizing their strong interconnections where they share the same fragile environmental resource base, and mutual interests where tourism can generates benefits through sourcing labour and supply of products and services locally. The projects form part of national strategies for both climate change adaptation and sustainable tourism development, supporting a number of related sectors and policy areas, such as agriculture, disaster risk management, health, water, education, among others. The projects successfully brought together key ministries (such as tourism, environment, urban planning and infrastructure, fisheries, economy), tourism private sector associations (tour operators, hotels, tourism board), as well as NGOs and academic institutions in both countries.

Tourism leading the way in environmental management: tourism operations need to comply with strict environmental regulations and procedures, often going beyond standards by implementing voluntary measures and innovative techniques, driven by company policies and commitments to preserve the pristine environment tourism strives on. In the Maldives, innovative measures implemented by resort islands include marine labs and collaborations with research institutions, coral gardening and conservation projects, portable groins to reduce erosion by adjusting to sediment movements, waste reduction and recycling becoming “0 plastic island” and community outreach programmes.

Further Information
- Maldives project: [www.unwto.org/maldives-climate](http://www.unwto.org/maldives-climate)
MOUNTAIN AND WINTER TOURISM DESTINATIONS

Conclusions:

Mountain regions are important destinations for global tourism. Snow cover and pristine mountain landscapes, the principal attractions for tourism in these regions, are the most vulnerable features to climate change. Besides the negative impacts, climate change can also bring opportunities in mountain areas. While winter season might shorten, summer season might lengthen, providing opportunities for other types of outdoor activities and tourism business that supply them (e.g., trekking, hiking, mountain biking, etc.).

Climate Adaptations in Tourism Event Programming at the Winterlude Festival (February) – Adapting to Warm Temperatures and Lack of Snow

- Moved programming from ice-covered lakes to land locations.
- Used refrigerated trucks for the ice sculpture carving contest.
- Lengthened the festival from ten days to a three-weekend event to increase the probability of suitable weather.
- Implemented snow-making to ensure adequate snow supply for skiing and sledding.
- Developed a Nordic ski track setter for low-snow conditions and concentrated Nordic ski race trails shaded terrain that required less snow.

Destination specific recommended measures:

- Implement snow-making, and make it more energy efficient;
- Groom ski slopes to reduce snow depth requirements;
- Preserve glacier areas;
- Move ski areas to higher altitudes or to colder north slopes;
- Improve water use and protect Alpine watersheds;
- Install avalanche prevention infrastructure into place;
- Diversify the offer to all season tourism and alternatives of snow sports (e.g., spas, hiking, cycling).

NATURE-BASED DESTINATIONS

Conclusions:

Nature-based tourism relies on a high diversity of tourism resources (landscapes, flagship species, ecosystems, outdoor activities relying on specific resources like water level in rivers for canoeing, etc.). These resources are highly variable in space, and will be affected by climate change in various ways. It is rather difficult to assess the magnitude of climate change impacts in nature-based destinations, given this diversity of resources, compared for example to ski resorts, (relying principally on snow conditions), or coastal resorts (relying mainly on beach and bathing water conditions). Although ecosystems can be highly vulnerable to climate change impacts, probably there are good adaptation options in ecotourism, given the wide range of activities that can be developed and conducted in natural areas. Therefore, there are good possibilities to design effective adaptation strategies for ecotourism and nature-based destinations.
Adaptation to Coral Reef Bleaching Events at the Great Barrier Reef, Australia

- **Climate Change Impact:** higher average and extreme sea surface temperatures, increase frequency and severity of coral bleaching events.

- **Adaptation Techniques, Policies or Measures:** Development of the Coral Bleaching Response Plan by the Great Barrier Reef Marine Park Authority in order to: improve ability to predict bleaching risk, provide early warnings of major coral bleaching events, measure the extent of bleaching, assess the ecological impacts of bleaching, involve the community in monitoring the health of the Reef, communicate and raise awareness about bleaching, and evaluate the implications of bleaching events for tourism management policy and strategies. The Great Barrier Reef Marine Park Authority and the Australian Ministry of Tourism have also considered other technical adaptations, including spraying cooler water from deeper areas onto ocean surface at peak heat times to cool surface waters and protect the corals from being damaged or using awnings or umbrella-like structures on buoys to shade corals in high visitation tourism areas.

- **Organization(s) Implementing Tools, Techniques, Policies or Measures:** Great Barrier Reef Marine Park Authority, tour operators, Australian Ministry of Tourism.

**Destination specific recommended measures:**

- Integrate climate factors into conservation and tourism management plans of protected areas, especially in biodiversity hotspots of LDCs and developing countries;

- establish monitoring survey programmes to assess ecosystem changes, their relation with tourism activities, and take necessary protection measures;

- opening up new ‘micro destinations’ and attractions within and adjacent to an already popular national park or heritage site;

- carry out re-design or redefinition of protected areas, for example creation of migratory corridors; and adjust tourism programmes accordingly;

- improve visitors and congestion management to prevent overuse of sites and physical impacts of visitation.
SUSTAINABLE DEVELOPMENT OF TOURISM (SDT)

Please visit our department's website for further information:

www.unwto.org/sdt
www.unwto.org/climate
www.climatesolutions.travel

The World Tourism Organization (UNWTO) is a specialized agency of the United Nations that serves as a global forum for tourism policy issues and a practical source of tourism know-how. Its Members include 154 countries, 7 territories as well as over 370 Affiliate Members from the public and private sectors. UNWTO’s mission is to promote and develop tourism as a significant means of fostering international peace and understanding, economic development and international trade.