TOURISM

ESTIMATES GLOBAL CLIMATE IMPACT

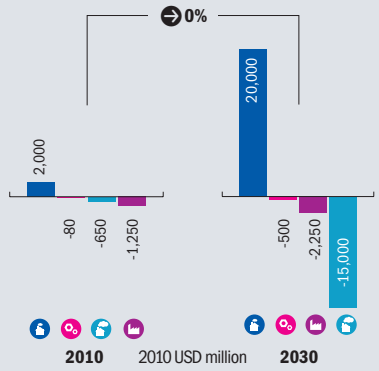
2010 EFFECT TODAY

USD **LOSS** PER YEAR **NIL**

2030 EFFECT TOMORROW

USD **LOSS** PER YEAR **NIL**

ECONOMIC IMPACT



CONFIDENCE **INDICATIVE**

SEVERITY
AFFECTED
INJUSTICE
PRIORITY
MDG EFFECT

- Impacts will affect tropical beaches and island destinations reliant on seaside and tropical reef tourism and winter sports as low-elevation reefs die and snowfall becomes unreliable
- Extreme and hot weather will affect tourism, but are not yet well understood
- Net global impact of climate change on tourism may not be negative; effects may redistribute tourism revenues among cooler countries with perceived climate advantages
- Adapting to impacts of climate change on tourism is challenging

RELATIVE IMPACT

$$$$$$ $ 2010
55 1

$$$$$$$ $ 2030
67 3

HOTSPOTS

2010 $ 2030

1,250 **INDONESIA** 10,000

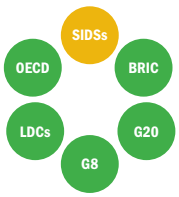
1,250 **MALAYSIA** 10,000

800 **INDIA** 8,000

600 **EGYPT** 5,000

200 **SRI LANKA** 1,750

GEOPOLITICAL VULNERABILITY



$ Economic Cost (2010 PPP non-discounted)
Developing Country Low Emitters
Developing Country High Emitters
Developed
Other Industrialized

$ = Losses per 10,000 USD of GDP

Change in relation to overall global population and/or GDP

$ = Millions of USD (2010 PPP non-discounted)

Tourism is clearly a climate-dependent sector. Weather conditions affect business in this sector, and general theory on the impact of climate change on tourism has been understood to favour cooler countries over tropical ones (Wall, 1998; Hamilton et al., 2005; Amelung et al., 2007). Yet there are exceptions: experts have suggested that Switzerland may see half of its ski stations become snow unreliable, with the snow reliability altitude rising from 1,200 metres today to over 1,800 metres, effectively stranding large, profitable, and irreplaceable ski zones (Elsasser and Bürki, 2002). Some economists have put forward evidence that the impact of climate change on tourism might result in an overall loss to global welfare (Berrittella et al., 2004). Tourism is currently a fast growing industry, however, and in the near term it is more likely that any impacts would instead trigger redistribution of tourism revenues away from low- and middle-income tropical coastal resorts to other global destinations, in particular high-income countries, which benefit from more pleasant weather as the planet warms (UNWTO, 2012; Harrison et al., 1999). Experts have been unsure about national outcomes for some countries—such as the tourist magnet France—which are exposed to a range of positive and negative tourism-related concerns (Ceron and Dubois, 2004). The full range of possible effects for tourism is large in scale, given the heavy reliance on outdoor recreation and environmental leisure activities (Jones and Phillips eds., 2011). This assessment is anchored in two relatively well-studied concerns: decline of reef-based and low-elevation winter sports tourism (Steiger, 2011; ECLAC, 2011). In this way, the Monitor's tourism indicator serves to ensure that adequate attention is given by policymakers to the issue of tourism and climate change, despite the lack of comprehensiveness in analysis here, since even through this narrow lens, some countries may experience 1% losses of GDP by 2030.

CLIMATE MECHANISM

The climate effect assessed here examines only the effects for reef-based and mountain tourism. The degradation and bleaching of coral reefs and a decline of tropical fish stocks is a clear consequence of the steady warming of the atmosphere and oceans (Hoegh-Guldberg et al., 2007). Likewise, climate propelled sea-level rise is leading to coastal erosion, affecting beaches and coral reefs (Nicholls and Cazenave, 2010). Cultural heritage sites around the world's coastlines are also affected or threatened by this erosion (UNESCO, 2010). These effects penalize tourism that has flourished in places where there is an abundance of coral for diving and other related pursuits (Uyarra et al., 2005; ECLAC, 2011).

Other clear effects on tourism are a general onset of shorter, milder winters, long-term glacier decline and a snow-line gradually gaining in elevation in mid- to high-latitude regions (Euskirchen et al., 2006; Kelly and Goulden, 2008). These combined effects entail a slight and gradual degradation of mountain resort offerings, especially in low-elevation areas, which in turn can limit revenues in a high-risk industry (Koenigg and Abegg, 1997; Scott, 2003; Steiger, 2011).

IMPACTS

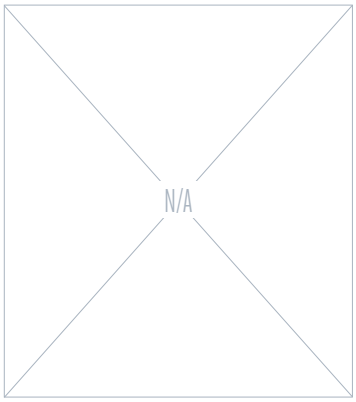
While the global effect is expected to be cost neutral, losses to affected countries are currently estimated at around 5 billion dollars a year, building to over 40 billion dollars, with an almost double share of global GDP in losses by 2030. Small island paradises such as the Bahamas, the Maldives, and Fiji dominate the list of countries most vulnerable to the negative effects of climate change on tourism. More marginal effects will also be felt in traditional skiing destinations, such as Australia, Austria, France, and Switzerland.

By 2030, lost revenue in tourism could cost upwards of 1% of GDP for several of the worst affected small island nations, although the greatest overall losses will be incurred in larger economies such as Egypt, Indonesia, or Malaysia. The effects for winter tourism host countries are expected to be marginal on a national scale, but could be highly unfavourable to mountain communities, which rely on short, peak seasons for the bulk of annual profits. Around 20–30 countries are estimated to experience serious effects; losses are estimated to be redistributed among high-latitude countries where domestic and foreign tourism is expected to improve along with favourable climate change. High-altitude ski resorts may also see surges in demand.

THE BROADER CONTEXT

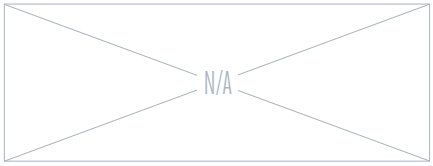
Tourism is a major growth industry globally, due especially to income and population trends that bolster

BIGGER PICTURE

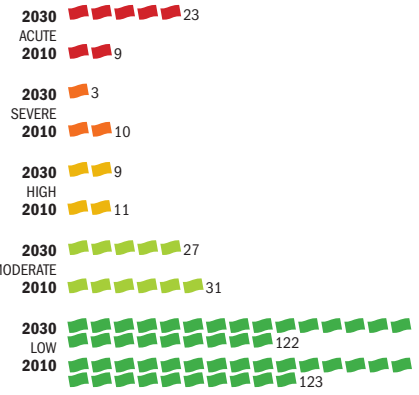


SURGE

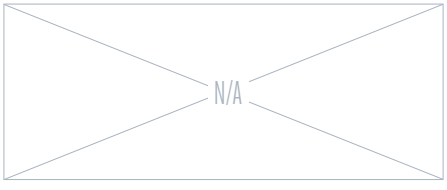
OCCURRENCE



VULNERABILITY SHIFT



PEAK IMPACT



GENDER BIAS

INDICATOR INFORMATION

MODEL: ECLAC, 2011; Steiger, 2011

EMISSION SCENARIO: SRES A1B (IPCC, 2000)

BASE DATA: Vanat, 2011; WTTC Website

= 5 countries (rounded)

Acute Severe High Moderate Low

the leisure sector (UNWTO, 2012). Given this growth, it is unlikely that any areas will experience significant absolute declines in revenues in the next few years (Hamilton et al., 2005). However, some niches in the industry grow more slowly than others: ski trips to mountain resorts have been stable over the last decade (Vanat, 2011). The broader industry context suggests that countries are more likely to have the growth of their tourism revenue slowed, rather than incur absolute losses, at least in the near term. This assessment represents an estimate of the potential opportunity cost for affected communities.

VULNERABILITIES AND WIDER OUTCOMES

KPMG identified the tourism sector as one of the industries most vulnerable to climate change, especially in light of physical risks, but also as one of the industries least prepared and therefore most likely to incur losses (KPMG, 2008). Geography clearly plays a role in physical risk, given the emphasis some experts have given to winners and losers in the global tourism industry depending on latitude (Amelung et al., 2007). The risks of coastal and mountain dependent tourist zones are also covered above. The size of the tourism sector and the level of its exposure to climate-related risks are the key determinants of vulnerability. Particularly in small island states, tourism is a large-scale revenue generator, whose remote locations allow unique access to a lucrative global market (Uyarra et al., 2005). Long-term sector decline could damage national income prospects and state expenditure on public goods such as schools, since tourism is an important form of public revenue in popular areas (Archabald and Naughton-Treves, 2001; Gooroochurn and Sinclair, 2005).

RESPONSES

In many cases, adaptation will require a diversification of the value offering of affected market segments, diversification away from long-term tourism-based risks where possible, and support or rehabilitation programmes to assist worst affected communities. Overcoming the unpreparedness of the sector to address climate stresses through awareness and education at different levels is of vital importance (Scott, 2011). However, the lack of preparedness of the sector underscores fundamental gaps in current response strategies (Scott et al., 2009). A variety of quite costly coastal conservation measures exist to stem beach and coastland erosion, but are unlikely to render such places more attractive to tourists (Klein et al., 2001). Strong environmental protection and sustainable fishing regulations, along with the promotion and expansion of natural marine reserves or mangrove forests can also help to boost local ecosystem resilience against coral and fish stock decline (Hughes et al., 2003; Corcoran et al., 2007). For low-elevation winter ski spots, relying on energy-intensive snow-making can assist to some degree, but would constitute a paradoxical response to the locally felt effect of global climate change on these vulnerable mountain tourist areas (Dawson et al., 2009). More generally, experts have raised concern about the potential for the tourism sector to become a major contributor to GHG emissions in the coming decades (Scott et al., 2010).

THE INDICATOR

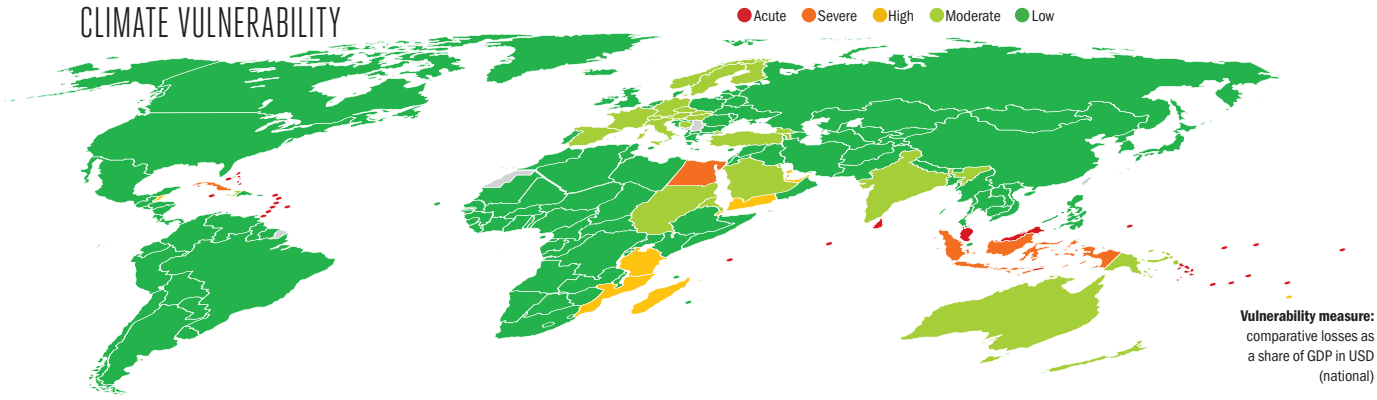
The indicator measures the effects of the loss in tourism revenue potential in tropical seaside resorts and winter ski resorts, based only on two separate studies on the question (Steiger, 2011; ECLAC, 2011). Given the climate factors involved, such as ocean temperatures and the length and temperature of winter ski seasons, the IPCC has been firm on the anticipated effects for the tourism industry (IPCC, 2007). The indicator should still be considered only to address the types of effects countries with a heavy reliance on reef and winter tourism might face. The main limitation is the lack of scope of the indicator, which captures only a fraction of the broader problem.

ESTIMATES COUNTRY-LEVEL IMPACT

COUNTRY	2010	2030
ACUTE		
Antigua and Barbuda	10	100
Bahamas	65	550
Barbados	40	400
Dominica	5	30
Fiji	20	200
Grenada	1	25
Jamaica	100	950
Kiribati	1	10
Malaysia	1,250	10,000
Maldives	15	150
Marshall Islands	1	5
Micronesia	1	15
Palau	1	5
Saint Lucia	10	100
Saint Vincent	5	25
Samoa	5	35
Seychelles	15	100
Solomon Islands	5	45
Sri Lanka	200	1,750
Timor-Leste	5	65
Trinidad and Tobago	100	900
Tuvalu		1
Vanuatu	10	100
SEVERE		
Cuba	150	1,250
Egypt	600	5,000
Indonesia	1,250	10,000
HIGH		
Bahrain	15	150
Belize	1	20
Djibouti	1	15
Madagascar	15	100
Mozambique	10	65
Tanzania	25	200
Tonga	1	5
United Arab Emirates	150	1,500
Yemen	30	250
MODERATE		
Armenia		
Australia	150	400
Austria	55	300
Bosnia and Herzegovina		5
Czech Republic	5	70
Eritrea	1	10
Finland	1	5
France	30	200
Georgia		
Germany	10	70
Haiti	1	25
Hungary	-1	5
India	800	8,000
Italy	15	85
Myanmar	10	95
New Zealand	1	5
Norway	1	15
Papua New Guinea	1	25
Qatar	10	80
Saudi Arabia	100	1,000
Slovakia	5	50
Slovenia	1	25
Spain	5	30
Sudan/South Sudan	10	60
Sweden	1	15
Switzerland	20	90
Turkey		1
LOW		
Afghanistan		
Albania		
Algeria		
Angola		
Argentina	-10	-65
Azerbaijan		
Bangladesh		
Belarus	-1	-20
Belgium	-1	-1
Benin		
Bhutan		
Bolivia		
Botswana		
Brazil		
Brunei		
Bulgaria	-1	-5
Burkina Faso		
Burundi		
Cambodia		
Cameroon		
Canada	-100	-200
Cape Verde		
Central African Republic		
Chad		
Chile	-1	-15
China	-3,500	-40,000
Colombia		
Comoros		
Congo		

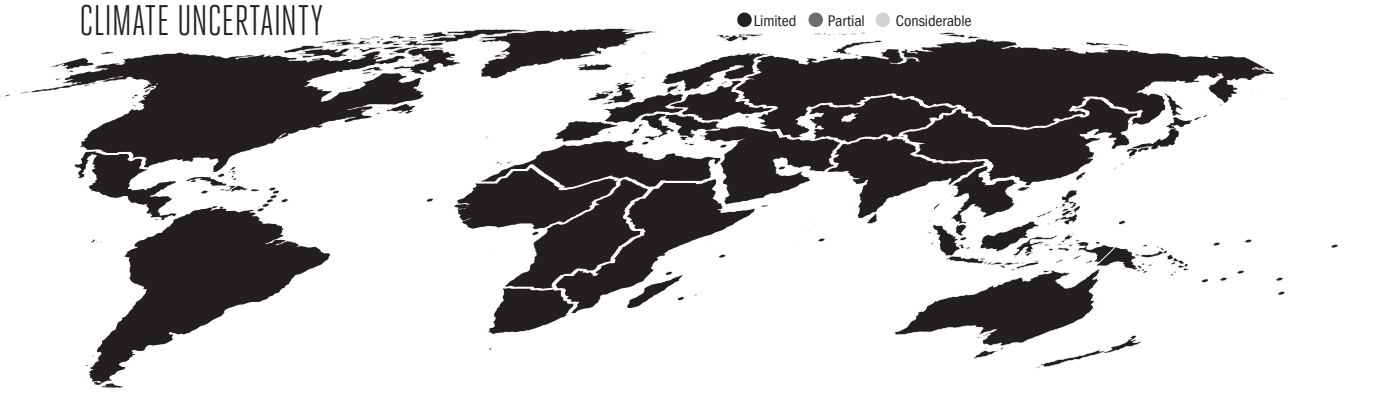
$ Additional economic costs due to climate change (million USD PPP) - yearly average

CLIMATE VULNERABILITY



Vulnerability measure: comparative losses as a share of GDP in USD (national)

CLIMATE UNCERTAINTY



COUNTRY	2010	2030
Costa Rica		
Cote d,Ivoire		
Croatia		
Cyprus		
Denmark	-1	-1
Dominican Republic		
DR Congo		
Ecuador		
El Salvador		
Equatorial Guinea		
Estonia		-1
Ethiopia		
Gabon		
Gambia		
Ghana		
Greece		
Guatemala		
Guinea		
Guinea-Bissau		
Guyana		
Honduras		
Iceland		
Iran		
Iraq		
Ireland	-1	-1
Israel		
Japan	-55	-5
Jordan		
Kazakhstan		
Kenya		
Kuwait		
Kyrgyzstan		

COUNTRY	2010	2030
Laos		
Latvia	-1	-1
Lebanon		
Lesotho		
Liberia		
Libya		
Lithuania	-1	-5
Luxembourg		
Macedonia		
Malawi		
Mali		
Malta		
Mauritania		
Mauritius		
Mexico		
Moldova		-1
Mongolia	-1	-5
Morocco		
Namibia		
Nepal		
Netherlands	-1	-5
Nicaragua		
Niger		
Nigeria		
North Korea	-15	-150
Oman		
Pakistan		
Panama		
Paraguay		
Peru		
Philippines		
Poland	-10	-65

COUNTRY	2010	2030
Portugal		
Romania	-1	-10
Russia	-65	-500
Rwanda		
Sao Tome and Principe		
Senegal		
Sierra Leone		
Singapore		
Somalia		
South Africa	-60	-400
South Korea	-35	-150
Suriname		
Swaziland		
Syria		
Tajikistan		
Thailand		
Togo		
Tunisia		
Turkmenistan		
Uganda		
Ukraine	-5	-35
United Kingdom	-5	-15
United States	-1,500	-3,250
Uruguay	-1	-5
Uzbekistan		
Venezuela		
Vietnam		
Zambia		
Zimbabwe		