

CLIMATE CHANGE = TOURISM CHANGE? - THE LIKELY IMPACTS OF CLIMATE CHANGE ON TOURISM IN GERMANY'S NORTH SEA COAST DESTINATIONS

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ABSTRACT Due to the strong evidence of global warming and climate change at a global scale, there is a need of studies that focus on the future impacts of climate change at a smaller scale and in a more regional context. Albeit the predicted changes in climate and i. g. water and ground surface temperatures in Western Europe may be less dramatic and extreme than in Southern Europe or Eastern North America, these changes shall induce adaptations of the natural and cultural, i. g. economic environments. In the rim areas of Germany's North Sea coast, tourism is important for the regional economy, especially during the summer season. But for Germans and potential tourists from other European countries these North Sea coast tourist destinations are currently secondary destinations; primary destinations are mainly located in the Mediterranean climate of Southern Europe. This paper focusses on these likely endogenous and exogenous climate-change-derived impacts on tourism on Germany's North Sea coast and takes into account the international competition of tourist destinations and tourism products.

KEYWORDS: *North Sea Tourism, Germany, climate change, climate perceptions, tourist behaviours, tourism products, future tourism*

INTRODUCTION

Over the last two to three years, the growing public awareness of global warming and the so called „climate change scenarios“ have raised attention among Germany's tourism professionals and local politicians in tourist areas. Even the federal government of Germany has started to finance interdisciplinary studies on the regional and local consequences and impacts of global warming and the forecasted climate change on Germany's tourist destinations. A more or less simple picture is promoted about tourism and climate change in the public as well as in academia: Germany will not be on the looser side, the losers shall be found among the Southern European countries like Spain, Italy and Greece.

A short geographical introduction of the study area: Germany's North Sea Coast Destinations are located on the south-eastern shores of the German Bight, the most south-eastern part of the North Sea. The coastal areas are formed by barrier islands, the wadden sea, the *Halligen* (island-like rests of former marshland), coastal marshland and river estuaries. As a classical lowland and wetland area, the dune formations on the barrier islands and the postglacial inland dune formations with heights of about 15m are the highest parts of the area. The North Sea wadden sea is the world largest tidal landscape with typical tidal flats, tidal gullies and coastal saltmarshes. It stretches from Den Helder (NL) in the West up to the middle of Danish Jutland Peninsula in the North. Like the Mediterranean Sea and the Baltic Sea the North Sea is an interregional trade sea since prehistoric times and played a major role in the cultural, political and economic development of Europe. Germany's North Sea barrier islands, *Halligen* and coastal rim belonged traditionally to the historical tribe area of the Frisians and therefore many landform and cultural area names refer to the Frisians and Frisia as their settlement region, i. g. the East and North Frisian and the Frisian Islands, East Frisia, North Frisia. The German North Sea coast is home of summer tourist destinations since the late 19th century, when seaside resorts became popular among the upper and middle class in an industrialising Germany. The tourism economy has developed ever since but only managed to become of national importance. Even for the Germans the Mediterranean areas became more important summer destinations since the beginning of mass tourism after World War II.

Because the paper deals with climate, climate change and impacts of climate change on tourism and tourist destinations, it is worth to mention that the coastal landscapes of this part of the North Sea are traditionally very instable landformations. The re- and transgression of the North Sea, which are expressed, for example, in historic floods in medieval times (i. g. 1362, 1634), lead to a loss of thousands of hectares of cultivated land since the 14th century and forced the local people to protect their settlements by warf building and dyking. Due to the marine plenty of the wadden seas and due to the fertile marshes, fishery and agriculture became the major source of regional income in medieval times. But crises due to, for example, floods and saltination were also common. Tourism became a well supported economic alternative, especially in those areas where the sandy and/or salty soils limited, restricted or prohibited agriculture. This was the case on the sandy barrier islands with their lack of fertile soils, and on the coastal shores, where the marshes outside the dyked areas were exposed to tidal or seasonal flooding, which both resulted in high saltination of the soils. But because of the climatic situation tourism was and still is mainly a summer-season-business. Many people in the local tourism industry have to make their annual income to more

then 80 % in a short period of three summer months (June, July and August). Outside the summer season only niche tourism is undertaken, i. g. windsurfing tourism, indigeneous cultural tourism.

The geomorphological elements of Germany's wadden sea area provide natural sand beach formations that are comparable to the Mediterranean beach tourism destinations only in the foreshore areas of the barrier islands and on western parts of a few smaller peninsulas like in St. Peter Ording (North Frisia). These foreshore areas also provide the rare situation of not falling dry during low tide. All the other coastal and inner wadden sea areas are heavily affected by the tidal system and fall dry several hours during low tide twice a day.

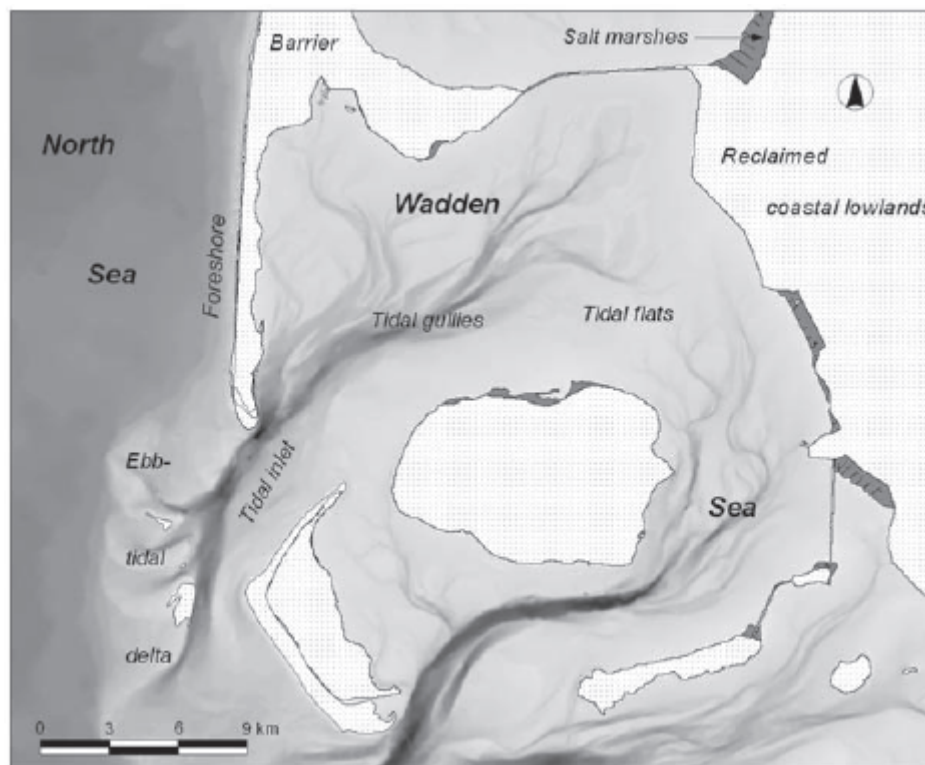


Figure 1: Map 'The geomorphological elements of the Wadden Sea' by Hofstede (2005)

This natural phenomenon of the tidal system, where the waterline disappears to a distance of 10 km and more from the original beach area, is very important for beach tourism that is based landwards of the foreshores of the barrier islands because it is limiting the access to sea waters for swimming, bathing and other waterbased tourist activities significantly. Also, during low tide a totally different environmental system is exposed: The dry-fallen tidal flats and the tidal gullies. This certainly are tourist attractions themselves, but in the very competitive world of tourism we have to ask: Does an ordinary sun-and-beach tourist – whatever that might be – want these attractions as regular as twice a day. In other words: Can

the tidal beaches of Germany's North Sea area compete with the nearly tide-free and, in terms of international tourism, well-established beaches of the Mediterranean?

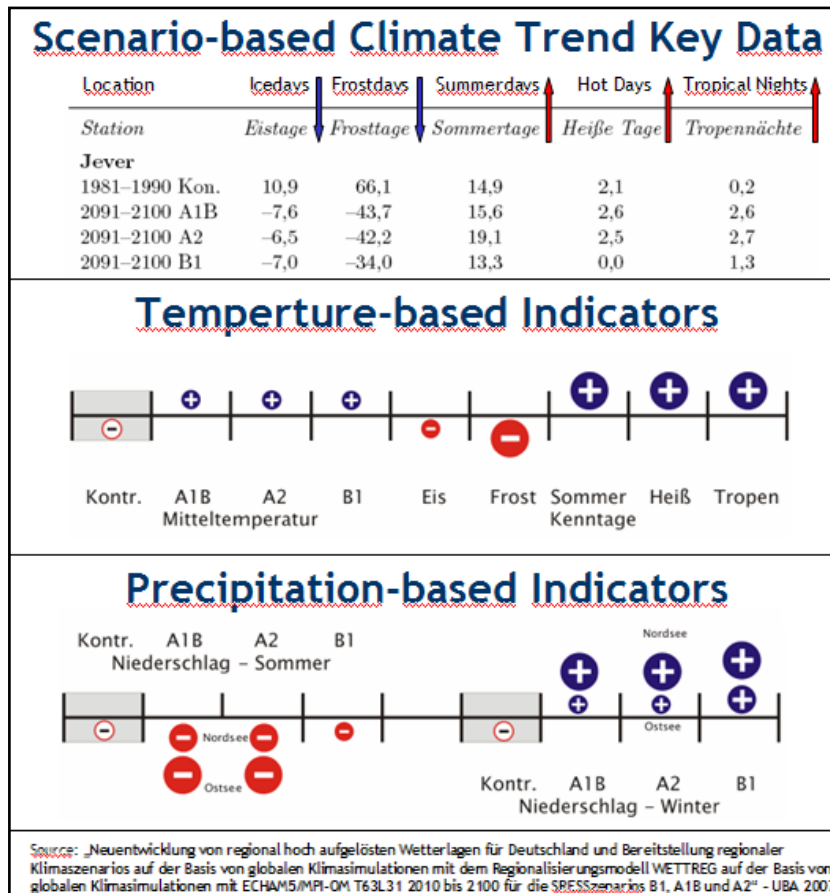
METHODS

In a first step, the state of art of regional climate change in Germany's North Sea coastal areas will be outlined. Because climate scientists have started to investigate the regional and local dimensions of global warming and climate change only just recently, there is a very limited number of such studies available. For this work the latest study of the UBA, the Federal Environment Agency of Germany, 'Neuentwicklung von regional hoch aufgelösten Wetterlagen für Deutschland und Bereitstellung regionaler Klimaszenarios [...]' (Enke et al., 2007), published in early 2007, was used to identify the likely regional meteorological changes in Germany's North Sea coastal areas that are caused by global warming and similar processes. The results of this UBA study form the groundwork for the continuative analysis of the likely endogenic impacts of regional global warming and regional climate change on tourism in Germany's North Sea tourist destinations. In an additional step, the likely exogenous impacts of global warming and climate change on these destinations are reviewed. Some of the latest studies about the impacts of climate change and global warming on popular European tourist destinations were analysed for predictions about such impacts. Finally the results of the different steps are being compared to each other and conjointly evaluated to identify likely interdependent impacts on tourism in Germany's North Sea destinations.

RESULTS AND DISCUSSION

The above mentioned UBA study on regional global warming and regional climate change in Germany is based on the statistical approach model WETTREG and the dynamic approach model REMO. WETTREG is based on data from meteorological stations and produces results for those stations for which also time series of measurements are available. Input data of the model include meteorological data from 282 climate stations and 1695 precipitation stations in Germany. The global climate simulations forming the basis of this statistical approach model WETTREG were calculated by means of ECHAM5/MPI-OM, a global model developed by the Max Planck Institute for Meteorology in Hamburg, and were run for the period from 2010 to 2100. The emissions scenarios A1B, A2 and B1 described in the Special Report on Emissions Scenarios (SRES) by the Intergovernmental Panel on Climate Change (IPCC) served as the data basis for those calculations. The results produced by global models like the ECHAM5 from the Max Planck Institute for Meteorology in Hamburg and, consequently, also those of the WETTREG regional model, cannot be regarded as forecasts,

they have to be considered as climate scenarios or climate projections. The regional simulations for Germany's coastal areas experienced a comparatively low rise in temperature



by the end of the end of the 21st century.

Figure 2: Scenario-based climate trend key data with threshold days, temperature-based and precipitation-based indicators for the North Sea coastal area location Jever (IPCC, 2004)

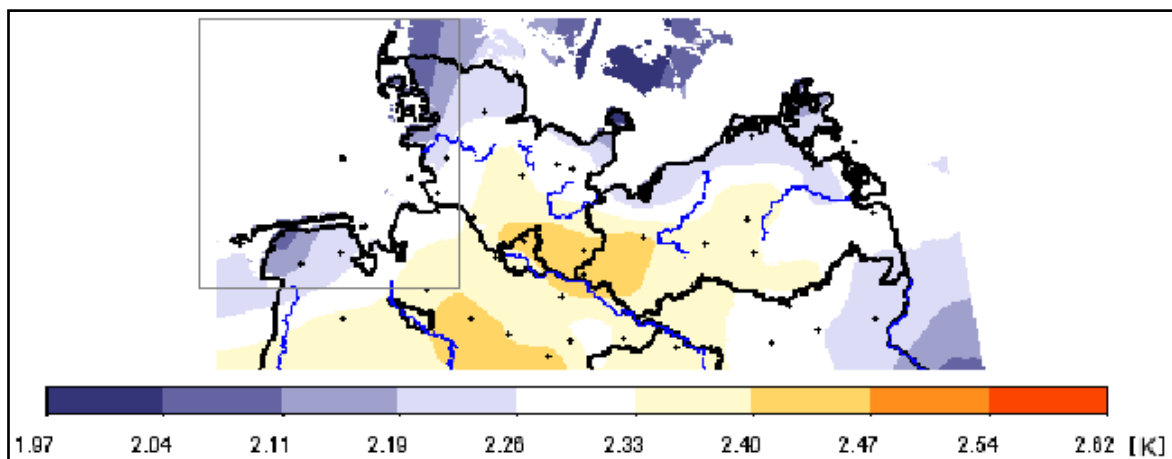


Figure 3: Scenario-based regional warming indices for Northern Germany (extract from IPCC, 2004)

Reasons for this include the proximity to the North and Baltic Sea and the in general relatively balanced and moderate character of the coastal climate in Germany. In addition, the WETTREG regional scenarios experienced only a slight decrease of precipitation during the tourism-relevant summer months, but a more significant increase in wintertime precipitation. In Figure 3 the blue color which is widely distributed across the map of the North Sea coast area represents a slight increase in temperature experienced in the WETTREG scenarios. This can be interpreted as a slight pull-factor for summer tourism, as the higher day temperatures during summer and the corresponding decrease of precipitation may attract more tourists to the shores and beaches of the North Sea area. But this is clearly not a 'Mediterranisation' of summer tourism conditions due to regional warming and regional climate change.

As well as the endogenous climatic pull-factors, the exogenous climatic push-factors that operate in favour of tourism in Germany's North Sea destinations also have to be evaluated. However, recently published research studies, which are partly based on grid cell climate change projections (Schröter et al., 2005), and also older tourists' climate perceptions studies (Mieczkowski, 1985), predict significant changes in tourists flows from the Mediterranean to more northern destinations. This will be due to the declining climatic attractiveness in the Mediterranean areas in summer. For this comparative content analysis the following recently published studies were considered (Berrittella et al., 2004, Hamilton, 2003, 2006, Hamilton et al., 2004, 2005, Lise et al., 2002, Maddison, 2001, MCCIP, 2006, Viner et al., 2003). In a generalised approach one can summarise the tourist-flows regarding conclusions of these studies in two statements:

1. The European South will lose summer tourists in significant numbers due to climate change and regional warming.
2. The European Northwest (North Sea destinations) and Northeast (Baltic Sea destinations) will gain summer tourists from the Mediterranean areas in significant numbers.

But from the viewpoint of tourist-behaviour-focused social sciences, all of these studies contain a combination of all or some of the same conceptual hidden faults:

- In opposition to tourism market realities these studies deal with stereotyped tourists behaviours and stereotyped tourists' reactions to regional climate change and regional warming.
- These studies are based on the unrealistic believe system that tourists react and decide on statistical or quantitative thresholds like maximum or minimum temperatures, maximum monthly precipitation etc. Qualitative decision factors and behavioural

patterns are widely ignored.

- These studies underestimate the possibility and potential of tourism continuing due to behavioural changes of tourists.
- And these studies ignore essential intrinsic differences of apparent equal or very similar tourism products, as there are in the case of Mediterranean beach tourism and North Sea tidal-system-integrated beach tourism.

Taking these conceptual hidden faults into account, we have to express our doubt about predictions of these studies regarding tourism and tourists behaviours; especially about predictions that significant numbers of beach tourists will be pushed out of the Mediterranean destinations and instead choose the tidal beaches of the North Sea area as climatic fitting substitute. We have to be very careful with the determination of the dimension and grade of this possible exogenous push-factor in favour of tourism in the North Sea area. Just as well, due to a growing competition among European beach destinations in the future, these moderate positive impacts on summer tourism climatic conditions in Germany's North Sea area may just be able to stabilise the current tourism market situations and may help to prevent these areas from a tourism decline. To predict the impact of regional global warming and regional climate change on tourism in Europe, more qualitative behavioural research is needed: we have to know more about the tourists, at least about their diverse and complex behaviours and multimotivated decision making in the tourism markets.

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