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Evaluation of the quality of European coastal water by German tourists

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Abstract

Tourism is mainly located along coastal areas and has become one of the most important economic factors for most areas along the European coast. Whilst the success of a tourist industry in those areas is often associated with an intact natural environment, it has to be considered that inappropriate strategies for tourism purposes can have direct negative impact on the environment. The increasing deterioration of coastal waters and tourists´ growing awareness about aspects of environmental quality led to the following questions addressed in this report: How important is water quality for tourists? Are tourists willing to pay more, even if only small amounts, to protect coastal waters? What kind of criteria do they use to assess water quality? And are there any noticeable spatial differences in the evaluation of the different regions of the European seas? In order to answer those questions a survey was undertaken, which involved interviewing 120 tourists at Westerland on Sylt in Germany, a typical beach vacation destination by the North Sea, as well as 210 potential tourists, which have been interviewed at a travel literature shop in Hamburg, Germany, who were still planning their vacation to a European coastal area at either the North Sea, the Baltic Sea, the Mediterranean or along the Atlantic. It can be concluded that water quality is an important factor for tourists in their choice of destination and should not be underestimated.

1 Background and Motivation

Worldwide the numbers of foreign tourists increased to approximately nine million in 2007, half of them travelling to Europe (UNWTO 2008). An estimated 63 % of all European tourists spend their holiday at European coasts (EC 2006a), mainly during the summer months. Coastal tourism does not only depend on the actual activity of swimming in the sea, though it is a dominant factor. The combination of sun, water, beach, and beautiful landscape makes it very attractive for other activities like walking and cycling, which are independent of the direct interaction of the ocean and the beach (Kolf 2006, Steinecke 2006). According to the Forschungsgemeinschaft Urlaub und Reisen (F.U.R) (2008) coastal regions are the most popular destinations for German tourists.

The sensitive coastal ecosystems are under increasing pressure by inadequate tourism strategies and other marine uses. That gives rise to concern about the marine environmental quality, because an intact environment is essential for the success of a tourist destination. Especially concerning coastal water the tourist destinations can suffer from bad water quality which is caused by different factors often located far away. Bad water pollution, nuisance algae blooms or accidental oil spills influence the aesthetic appearance and might also present a potential health hazard. Such an occurrence affects not only the image of a tourist destination negatively but damages the reputation of the tourism industry of the whole area. Such consequences could be observed along the Italian Adriatic Sea at the end of the 80s for example. Because of an intensive algae bloom the number of tourists went down by 30 % resulting in massive financial losses (Benoit & Comeau 2005: 319).

To implement successful strategies in compliance with integrated coastal zone management (ICZM) in order to protect coastal ecosystems, it is necessary to know how all the different land users, including tourists, perceive coastal areas. A scientist's integrated approach to the coast cannot be presumed to be a general state of consciousness (Ballnus 2004). The growing awareness of environmental quality by

tourists (Kösterke & von Laßberg 2005) and the deterioration of coastal water quality (EEA 2006) lead to the question of how important water quality is for tourists.

2 Objectives

The objective of this report is to find out how tourists assess water quality and theist importance in relation to their choice of destination. The following research questions will be addressed:

1. How important is water quality for tourists, and are they willing to pay more to help financing its protection?
2. What kind of criteria do tourists use to assess water quality? What do tourists mean when they use the term "good water quality" and what is perceived to be disturbing?
3. Are there any noticeable spatial differences in the evaluation of water quality at different regional European coasts?

3 Location and Methods

To get the personal opinions of the tourists a survey was undertaken. 120 tourists were asked directly at the beach in a typical holiday destination in Westerland on Sylt by the German North Sea and a further 210 potential tourists, in a travel literature shop in Hamburg, Germany. The advantage of questioning potential tourists is the possibility to determine the opinions of people who were still planning their vacation to a European coastal area at either the North Sea, the Baltic Sea, the Mediterranean or along the Atlantic. Further more it could be found if there is any difference in the evaluation of water quality by tourists still in the planning process or already at a tourist destination. A questionnaire of four pages with 23 questions was designed with only a few expressions differing for the two target groups but otherwise close enough to still warrant comparability.

To see the whole questionnaire and results see Preißler (2008). The beach-tourists, in the following named Sylt-tourists, were interviewed in July 2007 during the main holiday season in Germany, while the potential tourists were asked in June 2007 before the school holidays started. According to their coastal destination, the potential tourists were divided in 36 North Sea-, 40 Baltic Sea-, 90 Mediterranean- and 40 Atlantic-tourists. A first screening questionnaire made sure that only tourists, planning a trip to a coastal region have been asked. Four questionnaires could not be used, because overseas destinations were named, so that in total 206 questionnaires of potential tourists have been considered in the interpretation of the results. The statistical evaluation was carried out with SPSS for MS.

4 Results

Relevance of water quality for tourists and their willingness to pay for it

The Sylt-tourists can be regarded as typical beach tourists as their most important activities are bathing and sun-tanning. The potential tourists do more activities like walking and cycling and gave a lot more answers concerning cultural aspects, differentiating themselves from the classical bathing tourist. Despite this there is no considerable difference in the relevance of water quality for the choice of the holiday destination. For 86.6 % of the Sylt-tourists and for 81.5 % of the potential tourists water quality is "very important" and "important" respectively for the choice of destination. The choices for answers were in a range from 1 (very important) to 6 (absolutely unimportant). The fact that only 30 % of the Sylt-tourists and 35.9 % of the potential tourists get information about water quality before they choose their destination, and even fewer (15 % Sylt-tourists and 21.8 % potential tourists) get

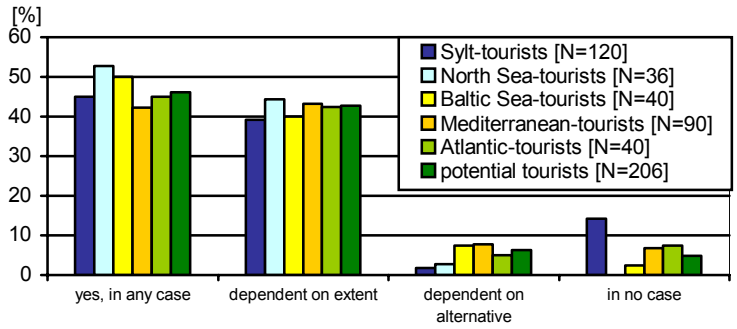

Figure 1: Change of holiday destination in case of an extreme event deteriorating water quality (Preißler 2008)

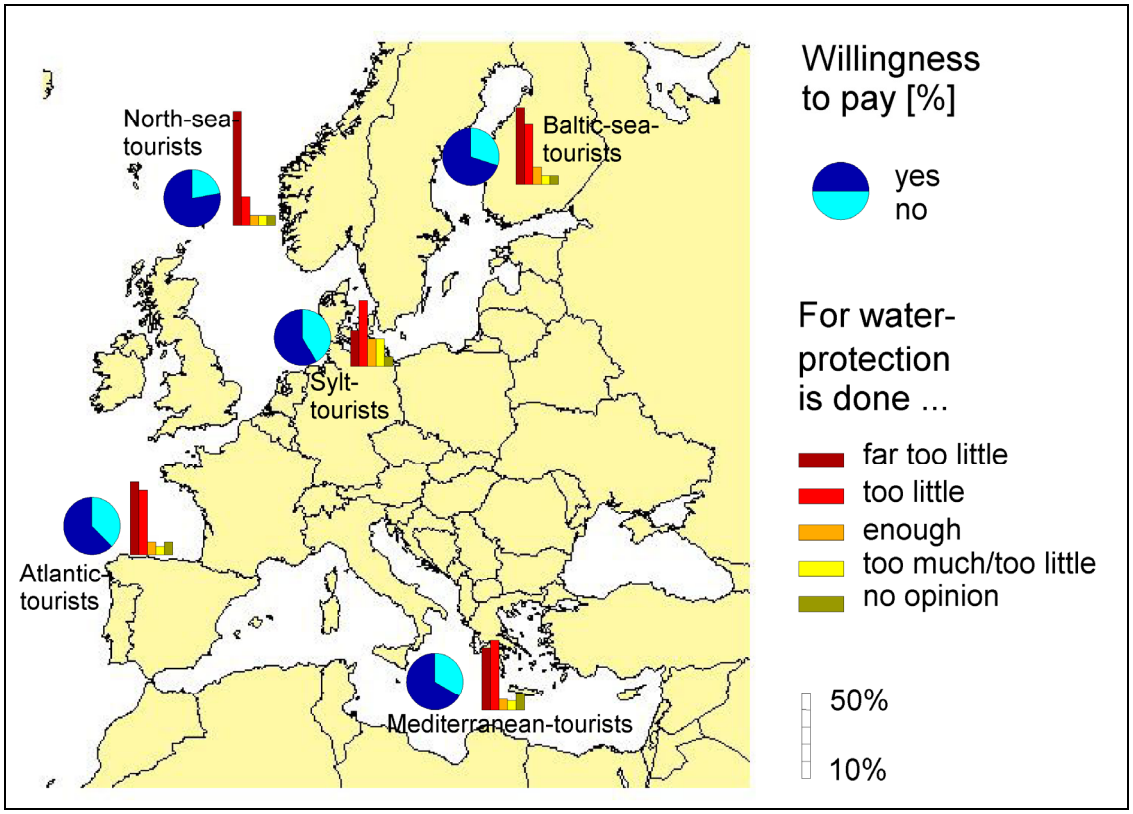

Figure 2: Attitude of tourists towards water protection and their willingness to pay more for its protection (Preißler 2008)

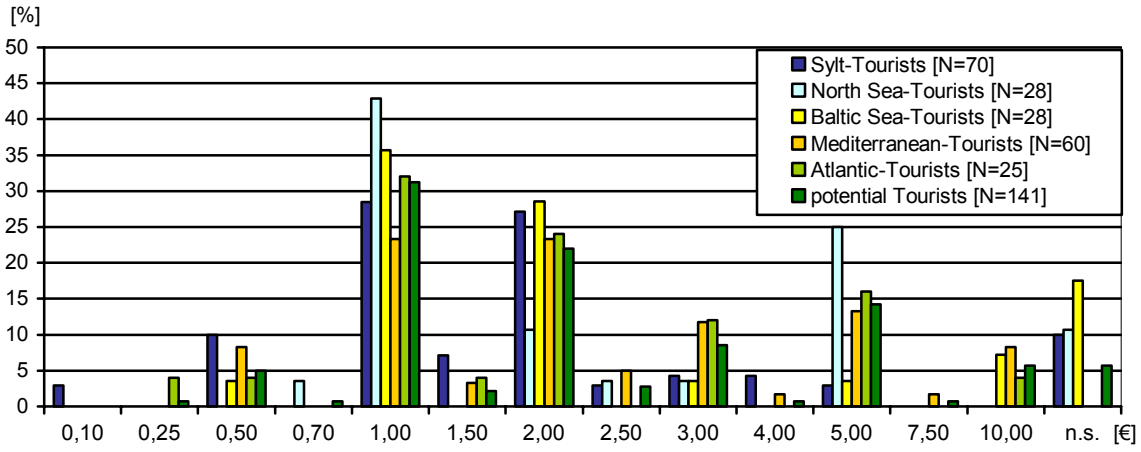

Figure 3: Willingness to pay an amount of ... € per day at the tourist destination to improve water quality (Preißler 2008)

information directly from their holiday destination shows that mentioned results have to be viewed differently. Often the Sylt-tourists said that they know the state of the water quality because they have spent their holidays in Sylt every summer for many years and they would get information if they were to travel to another destination.

That 45 % of the Sylt-tourists and 46.1 % of the potential tourists would change the holiday destination "in any case" if it is affected by an extreme event concerning water quality like an oil tanker accident or nuisance algae blooms shows that water quality is an important factor for tourists. More Sylt-tourists (14.2 %) than potential tourists (4.9 %) answered "in no case" which can be explained by a greater likelihood that tourists who spend their holiday every year in Sylt do not want to change their travel habits. Further more it can be concluded that bad water quality will be tolerated only to a certain extent, and that extreme events lead to a change in the holiday destination for most tourists (figure 1).

Potential tourists have a more positive attitude towards measures for water protection (figure 2). 79.7 % have the opinion that "far too little" is done for water protection. At 60 % of people questioned, this opinion among the Sylt-Tourists is still high. No interviewed tourists said that "too much" is being done. That is in conformity with the assessment as to how the water quality will be in the future. Most of the tourists (50% of the Sylt-tourists and 40.8 % potential tourists) think that improvements can only be achieved with "sufficient protection measures". To see if tourists are willing to do something themselves to support water protection they were asked if they would pay for it. The willingness to pay is higher among the potential tourists at 68.4 % compared to 58.3 % of the Sylt-tourists (figure 2). In the following question it was asked how much they could imagine paying for each holiday if it was guaranteed that the money would be used for water protection. The answers are shown in figure 3. Most amounts quoted are between 1 and 2 € per day. All together 45 % of the Sylt-tourists and 60 % of the potential tourists are willing to pay 1 € per day during their stay. Tourists with an academic degree are more willing to pay. Further correlations could not be identified, even with tourists who already experienced problems during a holiday due to bad water quality. 36.3 % of the Sylt-tourists and 27.2 % of the potential tourists, most of them Mediterranean tourists (35.6%), said that they were disturbed by bad water quality during their holidays. Problems occurred mostly in the Mediterranean and the North Sea and were due to algae and jellyfish.

Water quality can be seen as an important aspect of environmental quality, but cannot be seen as the critical criteria for the choice of holiday destination. This is only true to a certain degree of pollution though; because more than 80 % will change their destination in case of extreme bad water quality. For most tourists the ocean is part of the landscape constituting the most important criteria for the choice of the holiday destination. Water quality has a big aesthetic value for tourists and is an important aspect of the natural environment for coastal tourist destinations.

Criteria to assess water quality by tourists

The perception of water quality by tourists takes place predominantly by optical parameters (Dolch & Schernewski 2003) so that mainly visually noticeable, human caused, and natural parameters are assessed by tourists as a sign of good water quality in a range from 1 (very little) to 6 (very strong). The average and the rating are shown in table 1.

The most important indicator for good water quality is the rate of contaminants not exceeding critical levels. For 84.2 % of Sylt-tourists and 82.1 % of the potential tourists this is a "strong" and "very strong" sign of good water quality. Commonly the parameters "warm temperature" and "blue colour" are seen as a strong indicator for good water quality. "No smell" is similarly assessed by all tourists. The other aspects are judged very differently. "No jellyfish" seems to be very important for Sylt- and Mediterranean-tourists. The second important indicator for potential tourists is "clearness", especially for the Mediterranean-tourists, followed by "no foam". A significant difference is identified by the aspect "no seaweed or similar" which is not a strong point for potential tourists but the third most important one for Sylt-tourists.

Table 1: Average und rating (in parentheses) of different criteria as a sign for good water quality for tourists (1 = very little, 6 = very strong) (Preißler 2008)

	Sylt-tourists	potential tourists	North Sea-tourists	Baltic Sea-tourists	Mediterranean-tourists	Atlantic-tourists
Harmless rate of contaminants	5,37 (1)	5,29 (1)	4,94 (1)	4,98 (1)	5,41 (1)	5,63 (1)
No jelly fish	4,29 (2)	4,04 (4)	3,58 (5)	3,88 (4)	4,37 (4)	3,90 (3)
No seaweed or similar	3,91 (3)	3,57 (6)	3,14 (6)	3,48 (6)	3,78 (6)	3,58 (4)
No foam	3,75 (4)	4,52 (3)	4,31 (2)	4,35 (2)	4,61(3)	4,68 (2)
No smell	3,74 (5)	4,02 (5)	3,86 (4)	3,80 (5)	4,23 (5)	3,90 (3)
Clearness	3,74 (5)	4,65 (2)	4,22 (3)	4,18 (3)	4,82 (2)	4,68 (2)
Blue colour	2,53 (6)	3,29 (7)	2,72 (7)	3,08 (7)	3,61 (7)	3,30 (5)
Warm temperature	2,34 (7)	2,42 (8)	2,28 (8)	2,05 (8)	2,68 (8)	2,35 (6)

To estimate disturbing factors for tourists, in the following questions tourists were asked to assess parameters from 1 (very much disturbing) to 6 (not disturbing at all). Some aspects were given again to see if answers show any parallels or differences in regard to the aspects which are seen as a good indicator for water quality (see above). Average and rating are shown in table 2. Not surprisingly all tourist are disturbed mostly by “oil” and “litter”, a little less by “dead animals”. Sylt-tourists are also disturbed by “jellyfish”, whereas “jellyfish in the water” are more disturbing than “on the beach”.

Table 2: Average and rating (in parentheses) of different aspects concerning the water quality considered as disturbing by tourists (1 = very disturbing, 6 = not disturbing at all) (Preißler 2008)

	Sylt-tourists	potential tourists	North Sea-tourists	Baltic Sea-tourists	Mediterranean-tourists	Atlantic-tourists
Oilspills at the beach	1,23 (1)	1,32 (1)	1,31 (1)	1,00 (1)	1,56 (2)	1,10 (1)
Litter	1,25 (2)	1,34 (2)	1,42 (2)	1,15 (2)	1,50 (1)	1,10 (1)
Dead animals	1,61 (3)	1,59 (3)	1,61 (3)	1,58 (3)	1,63 (3)	1,48 (3)
Jelly fish in the water	2,22 (4)	2,43 (5)	2,44 (5)	2,60 (5)	2,19 (4)	2,78 (5)
Jelly fish at the beach	2,99 (5)	2,67 (6)	2,78 (6)	2,73 (6)	2,40 (5)	3,15 (6)
Foam	3,01 (6)	2,37 (4)	2,28 (4)	2,20 (4)	2,42 (6)	2,50 (4)
Seaweed or similar in the water	3,09 (7)	3,09 (7)	3,33 (7)	3,23 (7)	2,81 (7)	3,38 (7)
Seaweed or similar at the beach	3,43 (8)	3,35 (8)	3,47 (8)	3,58 (8)	3,06 (8)	3,68 (8)

The situation is similar for potential tourists; although for them “foam on the water” is more disturbing than “jellyfish”, which is in accordance with the aspects of indicators for good water quality. Sylt-tourists are more bothered by “foam” than seaweed or similar substances, which seems a little unusual because “no seaweed or similar” seems to be a more important sign for good water quality than “no foam”. Since the differences are barely discernible this can be disregarded. The occurrence of “seaweed or similar” is not viewed as quite so bad, although 39.1 % of Sylt-tourists and 35.4 of

potential tourists feel disturbed by if it is in the water and 30% Sylt-tourists and 27.6 % potential tourists, mostly Mediterranean-tourists, if it is on the beach.

Spatial differences in the evaluation of different regional European coastal water by tourists

Tourists were asked to assess the state of coastal water at their tourist destination from 1 (very good) to 6 (very bad). 82.5 % of Sylt-tourists and 68 % of potential tourists assessed the water quality to be "very good" or "good". North Sea-tourists assessed their coast to be the best quality with 77.8 %, answering at least "good", followed by Atlantic-tourists (72.5 %), and Baltic-tourists (66.7 %). Only 63.3 % of the Mediterranean-tourists think that the water quality is at least "good", consequently the evaluation of the Mediterranean is the least positive.

The fact that 35.8 % of the Sylt-tourists give no answer to the question "how the water quality has changed in the last years" shows that many of the tourists have no concept of the state of the coastal water. Among potential tourists the rate is higher with 57.3 %. Of the tourists who gave an answer, 43.4 % of the Sylt-tourists and 29.7 % of the potential tourists, are of the opinion that it has been at least a "little improved" (range from 1 (very improved) to 6 (very deteriorated). This is especially the case for the Baltic Sea-tourists (35%) and North Sea-tourists (33.4 %) who believe the water quality has improved at least "a little", but less so for the Atlantic tourists (27.5 %) and Mediterranean tourists (26.7 %). The quality of several coastal waters of different regional European Seas was assessed on a scale from 1 (very good) to 6 (very bad). The average and the rating are shown in table 3. The Sylt-tourists assessed the state of the North Sea to be by far the best. The North Sea-tourists on the other hand assessed all waters including the North Sea Coast more critically. Only 33.3 % think that it is "very good" or "good". Coastal water of the Baltic Sea of Sweden has the best water quality according to all tourists. The Baltic Sea-tourists especially assessed this coast as the best with 80 % saying "very good" and "good". The Mediterranean waters were presumed to be of the worst quality overall but the Mediterranean-tourists assessed "their" waters better than the average. Only 27.7 % of Mediterranean-tourists think that Mediterranean waters at the Spanish coast and 24.7 % at the Adriatic coast are in a "very good" or "good state". Many tourists remembered the algae bloom at the Adriatic Sea and so evaluated it more negatively. The Atlantic-tourists assessed the Atlantic coast as the coast with the best water quality.

Table 3: Average and rating (in parentheses) of the evaluation of the quality of different European coastal waters by tourists (1 = very good, 6 = very bad) (Preißler 2008)

	Sylt-tourists	potential tourists	North Sea-tourists	Baltic Sea-tourists	Mediterranean-tourists	Atlantic-tourists
North Sea coast of Germany	2,03 (1)	2,54 (2)	2,69 (2)	2,4 (3)	2,59 (2)	2,45 (3)
Baltic Sea coast of Sweden	2,41 (2)	2,38 (1)	2,66 (1)	2,1 (1)	2,4 (1)	2,38 (2)
Baltic Sea coast of Germany	2,52 (3)	2,66 (4)	3,00 (4)	2,38 (2)	2,74 (3)	2,5 (4)
Atlantic coast of France	2,61 (4)	2,63 (3)	2,86 (3)	2,46 (4)	2,75 (4)	2,35 (1)
Mediterranean coast of Spain	3,25 (5)	3,6 (6)	3,89 (6)	3,85 (6)	3,33 (6)	3,68 (5)
Mediterranean coast of Italy/Croatia	3,49 (6)	3,56 (5)	3,86 (5)	3,83 (5)	3,22 (5)	3,8 (6)

The other tourists seem not to have a positive image of the Atlantic coastal water. Many noted that the water quality would have to be bad at the Atlantic coast because big oil tanker accidents happened there. In total few definite conclusions can be drawn besides the positive assessment of the Swedish coastal water of the Baltic Sea and the least positive assessment of coastal waters for the Mediterranean coast. The tourists´ own personal relevant coasts are assessed as the best or at least better than average.

5 Discussion and conclusion

According to the results of the survey it can be concluded that water quality is an important factor for tourists. The interviewed tourists were very interested in the subject and enjoyed participating in the survey. Since there have been 532,651 tourists in the year 2007 or 50,165 tourists in the month of July (Tourismus-Service Westerland 2008) and considering fact that there is no given population of the potential tourists in Hamburg, the results are not representative and are only to be considered as a trend.

Water quality can not be viewed as the main criteria for the choice of destination, although most tourists said that it is very important, but it is an aspect which is considered and leads to a change of the holiday destination for most tourists if it is in a very bad condition. Most tourists think that the water quality at their holiday destination is in a "good" or "very good" state. These declarations are somewhat questionable in view of the fact that less than a third of them gains information about it. Considerable differences in the assessment of water quality between Sylt-tourists and potential tourists could not be identified.

Protection measures are seen as required and useful when the perceived state is not conform with the personal image (Raffelsiefer 1999). It can be concluded that most of the tourists are aware that more has to be done to protect coastal water. Results revealed that according to most tourists more water protection is necessary to improve water quality. In addition, the willingness to pay for measures to improve water quality can be seen as high. It is higher among the potential tourists, which can be explained by more tourists in that group holding academic degrees and the fact that Sylt-tourists already have to pay visitor's tax. Some of "the unwilling to pay" Sylt-tourists noted that some of the visitor's tax could be used so they are not generally against it. Some tourists voiced the opinion that they are not the ones causing the problems and that the polluter should pay for it.

As expounded in Dolch & Schernewski (2003) human caused aspects concerning water quality were assessed as the most negative ones. Although tourists do differentiate between human caused pollution and natural elements in the water, most of them feel disturbed by natural components of the sea. "No jellyfish" is regarded as a very strong indicator for good water quality to Sylt-tourists. This might be explained by the fact that during the time of the survey more jellyfish than usual were observed in the water and on the beach. Many tourists said they are normally not disturbed by algae and jellyfish but would be in the case of high concentrations or the presence of dangerous species. Algae and jellyfish are also mentioned in the answers of most tourists who had problems due to bad water quality. An increasing appearance of algae and jellyfish can be seen as an effect of eutrophication; the biggest problem for coastal water (EEA 2006).

The assessment of the water quality at their own holiday destination and of several different European coasts shows that tourists assess their own personal choice as the best or at least better than the average as it is known from the hazard research (Homburg & Matthies 1998). It has to be considered that this is only the subjective opinion of tourists which cannot be regarded as an objective evaluation of the state of coastal waters. According to all tourists the Baltic Sea seems to have the best water quality and the Mediterranean the worst. It has to be considered that the assessment by tourists is not in accordance with European directives concerning hygienic standards for bathing water. Over 90 % of coastal areas in the European Union have been rated as very good quality in the year 2006 according to that directive (EC 2007a, EC 2007b). Comparable data for all of the regional European

Seas is still lacking for the ecological water quality but will hopefully change in the future within the implementation of the water framework directive (Heinrich 2003). In addition tourists do not base their assessment on actual natural and ecological conditions. According to marine environmental status reports the coastal water is in an alarming state, especially in half-enclosed marginal seas like the Baltic and the Mediterranean (Benoit & Comeau 2005, EEA 2006, HELCOM 2003, OSPAR 2000). Notes about oil tanker accidents or algae blooms show that a negative image lasts a long time in the mind of a tourist, which has more influences on the assessment of water quality. Because the potential tourist has many different holiday destinations to coastal areas all around Europe, a direct comparison of the assessment by tourists and the actual state of water quality there was not possible.

A deterioration of the environment reduces the potential of the ocean as a basis for income and employment and for successful development of coastal and sea tourism (EC 2006b). The expenses in the healthcare and other economic losses due to bad water quality are higher than investments to achieve good water quality (e.g. treatment plants) (EC 2002). Other representative surveys have shown that clean water and clean beaches are the most important aspect for satisfaction on holidays for 65 % of tourists. The reduced reported grievances of tourists concerning environmental issues in those holiday resorts which have implemented measures towards environmental protection show that improvements are indeed acknowledged and appreciated by tourists. This should motivate all relevant tourist authorities to invest more towards the protection of the natural environment (Kösterke & Laßberg 2005:13, 75).

6 Recommendation

It is recommended that more surveys be conducted in other tourist destinations, more inland as well as those of other nations. For better comparability a contingent valuation with pictures of different scenarios is highly recommended, especially since many tourists said that it depends on the extent of the damage in their assessment of a situation. Furthermore questions regarding health risks, contamination of sea products or the willingness to save water are conceivable.

Algae and jelly fish are the factors mostly mentioned by tourists who already had negative experiences with bad water quality during a holiday. These occurrences are caused by eutrophication so that measures to reduce discharge of agricultural fertilizer residues and liquid manure are urgently necessary. Tourists could be informed better about what is being done for water protection and what kind of improvements could be achieved as most tourists showed a high interest during the interviews. This could lead to a better understanding for environmental issues by tourists. If for example tourists know more about the ecological relevance of seaweed it can be assumed that they are more likely to accept it and would not feel disturbed by it to such an extent. Environmental education events at attractive leisure time facilities in the tourist destinations could lead to better understanding. If tourists know that their lifestyle in general has effects for the coast and the ocean there is a chance that they are willing to change their habits in every day life in towards a greater benefit. The quality demands of tourists and the awareness to environmental aspects have increased and an intact environment, good water quality playing a pivotal role in this, is required if coastal tourism shall succeed. Concerning water quality the attitude towards protection measures and the willingness to pay by tourists is high.

To avoid further deterioration and to promote sustainable use of coastal regions it is necessary that all citizens participate by responsible use of the valuable natural resource water.

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