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Algae blooms and their consequences on camping tourism destinations: The case of Öland, Sweden

Abstract

In Sweden camping tourism holds the position as one of the largest niches within the tourism accommodation sector. The camping sector represents more than 17 million or 35% of commercial overnight stays in total. On the island of Öland which is located in Kalmar county, and in Kalmar county itself, the camping sector represents more than 1.75 million or 65% of the annual overnight stays which positions Kalmar and Öland as the second largest camping region in Sweden. However, tourism businesses, and especially island tourism systems, can be vulnerable to shifting environmental conditions. In recent years, the media has highlighted the issue of harmful algae blooms frequently affecting coastlines in the Baltic Sea. Based on structured interviews, this article investigates the perceptions campground managers and camping tourists have of the impact of algae blooms on tourism. The results show that both among campground managers and visitors, algae blooms are perceived as an environmental concern that might affect tourism in negative ways.

Key words:
algae blooms; environmental change; camping tourism; Sweden

Introduction

In recent decades many rural and peripheral areas in Sweden have gone through changes due to general restructuring (Lundmark, 2006; Marjavaara, 2008). The effects of this are displayed in a decreasing local labor market within traditional niches like agriculture, fishing, forestry and industry. In some peripheral areas this has led to economic decline and out-migration while in other areas it has resulted in the transformation of the economy towards an increased reliance on the service sectors (Massey, 2005; Lundmark, 2006; Foghagen, 2007). For many rural areas tourism has emerged as a way to adapt to this new economic situation (Aronsson, 1993; Butler, Hall & Jenkins, 1998; Saeter, 1998; Johansson, 1999; Saarinen, 2003; Lundmark, 2006; Müller & Ullrich, 2007; Marjavaara, 2008; Hall, Müller & Saarinen, 2009). This leads to a situation in which the local livelihood system becomes more dependent on tourism as the primary economic niche.

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Especially for island destinations, it increases the vulnerability of the local economy since there are limited options (Marjavaara, 2008). Islands have limitations due to their isolated location and lack of opportunities in terms of employment and labor market. Therefore they are sensitive to changes that may affect the local livelihood system (Kelman, 2007; Dodds, 2007; Marjavaara, 2007). In the case of Öland, a Baltic Sea island in the southeast of Sweden, the consequences of out-migration and a decreasing employment market are more evident in the peripheral areas, especially on the northern part of the island. Changes and general destruction in agriculture, fishing, the stone industry and public sectors like the health care and day care services in recent decades have resulted in a diminishing labor market and rural decline in these areas (Foghagen, 2007). As argued by Lundmark (2006), many rural areas turn to tourism and service sectors in scenarios like this, and Öland is no exception.

Camping in commercial campgrounds is an important type of accommodation for many rural destinations. Commercial campgrounds for summer tourism are often located close to beaches and are therefore easily affected by changes in the climate and the environment. Recent reports on climate change predict disturbance regimes in the atmosphere and oceans, changes in sea levels, increasing temperatures, precipitation extremes and biotic change (IPCC, 2001; Gössling & Hall, 2006; IPCC, 2007; Pearl & Huissman, 2008; UNWTO, 2008; The Copenhagen Diagnosis, 2009) and thus it is an important question how camping entrepreneurs and tourists do perceive these changes and how they plan to adapt to them.

The purpose of this study is to investigate whether algae blooms are perceived as an environmental problem by visitors and commercial campgrounds on camping and island destinations, whether there are discrepancies between the perceptions of visitors and campground managers, and whether steps are being taken to adapt to the effects of algae blooms in the area. This is analyzed through the case of Öland, Southeast Sweden.

Environmental change

The problems of environmental change are multifaceted and just as human action affects the environment, human action is affected by environmental change (see Jäger & Barry, 1990; Lowenthal, 1990; Sommer & Frenzel, 2005; Hoagland & Scatasta, 2006; Gössling & Hall, 2006).

According to Gössling and Hall (2006) the awareness and effects of global environmental change is becoming an increasingly important issue for the tourism business. Impacts on the tourism industry from environmental change are already evident at many resorts and in many regions (Scott, 2001; Gyimóthy, 2006, p. 258; Gössling & Hall, 2006, p. 310). Reports on impacts from climate change predict more extreme weather conditions (IPCC, 1995; IPCC, 2001; De Freitas, 2006; IPCC, 2007; Gössling & Upham, 2009; The Copenhagen Diagnosis, 2009). According to De Freitas (2006) some climate modelling indicates a possibility of an increased frequency of extreme weather events on a global scale. However, because there is a lack of sufficient

studies available these indications are questioned by De Freitas (2006) as well as the Intergovernmental Panel on Climate Change (IPCC, 2007), among others. Recent research has shown however, that the scenarios predicting increased numbers of extreme weather events are probable. The frequency of extreme weather events, especially severe tropic cyclones and thunderstorms due to anthropogenic climate change, is expected to increase (e.g. Aumann, Ruzmaikin & Teixeira, 2008; The Copenhagen Diagnosis, 2009). In cases of events like these the consequences will probably also affect areas outside the actual cyclone and hurricane areas. It is important to emphasise that there are still uncertainties about these models and a great deal of work remains to be done in order to determine the probable regional and geographic consequences and frequency of severe weather events due to climate change (The Copenhagen Diagnosis, 2009). From a Nordic perspective reports of changing weather events predict, among other things, increasing temperatures, unstable weather, and changes in precipitation, biotic change and a greater variability in snow conditions (Perry, 2005; SMHI, 2010; Gössling, 2006; Bodén, 2007; The Copenhagen Diagnosis, 2009).

Research on the impacts from harmful algae blooms (HAB) shows potential economic backlashes for sectors like fishing and tourism among other industries (Perry, 2005; Hoagland, Anderson, Kaoru, White, 2002). Human activity is often blamed for the enhanced HAB-events. Studies of algae blooms show that eutrophication as a result of fluctuating levels of nitrogen (N) and phosphorus (P) in sea water, as well as climate change have been proven to be among the causes of HAB-events in the Baltic Sea (Peperzak, 2003; Sommer & Frenzel, 2005). Marine ecosystems are vulnerable to changes or disturbances and HAB-events are reported in the Baltic Sea as well as in marine water environments around the world (Hoagland et al., 2002; Masó, Garcés, Pagès & Camp, 2003; Basterretxea, Garcés, Jordi, Masó & Tintoré, 2004; Gilbert, Anderson, Gentien, Granéli & Sellner, 2005; Romero, 2010).

There are studies indicating an expected increase in HAB occurrences in certain areas in the future due to climate change and anthropogenic pollution (Peperzak, 2003; Basterretxea et al., 2004; Gilbert et al., 2005). Pearl and Huissman (2008) predict an increase of algae blooms and especially cyanobacteria in the future due to increased temperatures. According to Romero (2010) acidification (low pH) and increased water temperatures may favour the phytoplankton biomass. Experimental mesocosm-studies of phytoplankton spring and summer blooms (algae blooms) showed that fluctuations in pH and temperature had significant effects on the length and intensity of the blooms. High temperatures and low pH were favourable for most species. However the cyanobacteria, nodularia spumigena, did not respond as positive to low pH as other species. Studies of HAB-events in for example, the United States indicate occurrences of HAB-events in more locations than ever before and frequent HAB-events are expected in the future (Hoagland et al., 2002; Pearl & Huissman, 2008).

The Baltic Sea hosts many different species of micro algae which together compose a valuable foundation for the marine food chain. However, a large increase of algae can

cause a disturbance in the food-web dynamic, like for example the accumulation of toxins from algae in shellfish (Gilbert et al., 2005; SMHI, 2009e; Romero, 2010). Al gae blooms, of which most species are harmless, occur frequently in the Baltic Sea during the spring and summer seasons. However, the potential consequences are not only ecological, frequent algae appearances in the Baltic Sea may affect economic sectors like tourism and also lead to more cases of illness and health consequences due to algae exposure. The Baltic Sea has experienced extreme HAB-events repeatedly in the last ten years resulting in media reports and reactions among tourism stakeholders claiming economic losses due to algae blooms (Foghagen, 2007; Hasselström, 2008, p. 369; Naturvårdsverket, 2009, p. 33).

Adaptation and camping tourism

Camping and caravanning developed in the 1950's as a form of working-class, low-budget tourism. Caravanning became a highly appreciated niche within camping tourism and during the 70's and 80's it became the symbol of the summer holiday for Swedish working-class and middle-class families (Nordström & Mårtensson, 1966; William & Shaw, 1998; Löfgren, 1999). Despite its popularity, camping tourism has gained little interest among the academic research community.

Camping tourism has maintained its popularity in Scandinavia and today it is one of the most popular forms of tourism in Sweden. According to the The National Swedish Campsite Association (SCR) and Statistics Sweden, the camping sector represents more than 17 million overnight stays in commercial campgrounds in Sweden every year (Tillväxtverket, 2010; NUTEK/SCB, 2007; SCR, 2009). This is equal to 35% of all commercial overnight stays in Sweden (NUTEK/SCB, 2007; Tillväxtverket, 2008). In many Swedish rural or peripheral summer tourism destinations, camping is the largest form of tourism (SCR, 2009; NUTEK/SCB, 2007; Tillväxtverket, 2008).

Since camping or caravanning traditionally has been closely connected to seaside tourism it can be affected by impacts from climate change. Many destinations where beach-related tourism and camping is an important niche in the tourism system may be challenged by changing natural conditions due to changes in the climate and environment (UNWTO, 2008). The local environment, weather and physical resources have a strong influence on the tourism sector (Scott, McBoyle, Mills & Wall, 2001; Perry, 1997). Islands, coastal regions and seaside resorts have been pointed out as being among the most vulnerable to climate and environmental change (IPCC, 2001; Perry, 2005; UNWTO, 2008; The Copenhagen Diagnosis, 2009). Even though the tourism industry in general is flexible and must continuously respond and adapt to changes, weather extremes, algae blooms and changes in water quality which can lead to devastating effects for summer destinations present extra challenges and potential threats for the industry (IPCC, 2001; Perry, 2005; UNWTO, 2008).

Hall and Lew (2009) describe tourism as a complex adaptive system which is referred to as a self-organizing, complex collection of interactive agents or elements. These ele-

ments could be firms, tour operators, individuals, municipalities, hospitals and health care units, non-governmental organizations and so on (Hall & Lew, 2009, p. 69). Tourism consumption links these elements together composing the tourism product (Hall & Lew, 2009). However, the time perspectives required in order for the tourism sector to adapt to climate change are very long compared to time perspectives on impacts from climate and environmental change (UNWTO, 2008).

According to Campiranon (2010) there are two important levels of risk management, the proactive and the reactive. Proactive strategies which are prepared before the actual situation are a way to mitigate the potential impacts. According to the UNWTO (2008) it is important to implement adaptation strategies in order to respond to climate changes which can affect destinations in the near future. The potential flexibility and adaptability differs between countries, regions and destinations but also between agents or elements within tourism or destination systems. The destination system is dependent upon elements like accommodation, food and beverage and attractions in order to be successful (Hall & Lew, 2009; Kamfjord, 1999). There is, however, a potential risk that climate and environmental change will affect place-bound actors like hotels, resorts and campgrounds with permanent facilities more than mobile actors and actors that are not dependent on beach-related tourism (UNWTO, 2008).

For adaptation to be successful the tourism system needs to apply changes to all levels of the destination system. Adaptation requires change and for individual firms may include aspects like water recycling, informing employees and customers in order to redirect visitors from affected areas, water conservation plans, and the adjustment or development of products. Small island destinations that can be repeatedly exposed to impacts like algae blooms, strong winds, precipitation extremes and rising sea levels are often limited in adaptability due to their peripheral location. Also, the types of tourism which are closely connected to summer tourism and the use of beaches may face consequences from changes in the environment in terms of beach erosion, deteriorating water quality and rising sea levels (UNWTO, 2008).

Research background

Even in Sweden questions about how changes in the climate and the environments affect tourism destinations have recently been discussed in the media. One of the main concerns for Swedish summer tourism has been harmful algae blooms (HAB) affecting the coastlines (Barometern, 2008a; Ölandsbladet, 2008; SVT, 2009; Sandqvist, 2009). Because of its continual potential threat to tourism businesses and visitors, algae blooming is a topic which is discussed regularly in the media and by authorities even during periods when no algae bloom is present. In 2009 the World Wide Fund and the media reports predicted that algae blooms would be severe during the summer. Despite this, tourism entrepreneurs on Öland reported an increase in tourism income and arriving tourists for the summer (SCB, 2010a; SCB, 2010b; WWF, 2009; Tillväxtverket, 2010). Media reports of algae blooms affecting coastlines and summer resorts focused especially on the species of algae called, cyanobacteria (Sandqvist, 2009),

which in certain compositions and levels can be harmful to humans. The peak season for tourism on Öland is summer time which coincides with the blooming of the cyanobacteria algae. If algae blooms continue to affect coastlines and the concentration of harmful algae increases, this may also increasingly affect summer tourism in the Baltic Sea. This could be devastating to many destinations, but especially islands and seaside ones, which are dependent upon tourism and therefore vulnerable to changes that might cause its decline (Becheri, 2002; Hoagland, Anderson, Kaoru & White, 2000; Perry, 2000; Peperzak, 2003). In recent years tourism stakeholders on the Swedish island Öland have, at least partially, blamed economic backlash on the algae blooms in the Baltic Sea and especially the blooming of cyanobacteria. Recent reports from the Swedish Environmental Protection Agency describe consequences in terms of economic backlash for Öland with a loss in tourism turnover in 2005 of about 27 million Euro caused by algae blooms and their related media coverage (Hasselström, 2008, p. 369; Naturvårdsverket, 2009, p. 33). Rainy summers and bad weather are also believed to affect tourism negatively (Foghagen, 2007; UNWTO, 2008).

ALGAE BLOOMS AND CAMPING OVERNIGHT STAYS

The National Swedish Campsite Association (SCR) proclaims that the camping tourism sector had a successful summer 2009 (SCR, 2010). According to SCB, the number of nights spent in commercial campgrounds in Sweden increased by 6.1% in 2009 while the increase for all accommodation sectors together was 2.1% (SCR, 2010). Camping was the accommodation sector with the single biggest increase rate in 2009 (SCR, 2010; Tillväxtverket, 2010).

The number of nights spent on Öland and in Kalmar county increased by 10.5% from 2.5 million overnight stays in 2008 to 2.76 million in 2009. Nights spent in campgrounds or cottages represent 1.8 of the total 2.76 million nights spent on Öland and in Kalmar county. The camping sector increased 14.3% which is, aside from private cottage rentals, the largest increase of all types of accommodation in the region (SCB, 2010a). Camping, as a single sector, represent 1.6 million overnight stays and the number of overnight stays in commercially arranged private cottage rentals was 192,000 (SCB, 2010a).

Accommodation statistics of overnight stays are one way to measure the number of visitors in a destination and the SCB collects data on the number of overnight stays per region and by type of establishment every year. The tourism business is potentially vulnerable to environmental change and algae blooms.

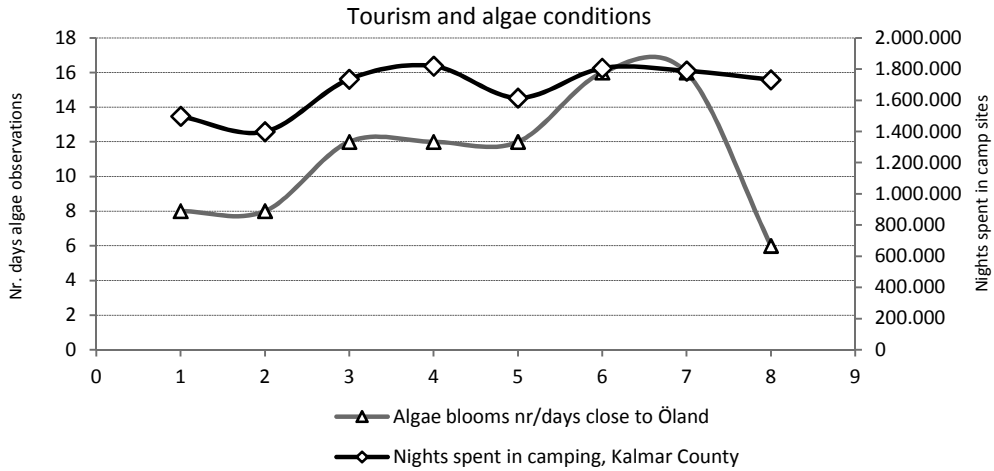
Accommodation statistics are presented by region thereby making it easy to compare regions but also changes within regions over time (Figure 1). The data for algae blooms is based on the measured number of days with surface agglomerations' of algae blooms, observed in the Baltic Sea. The reason to use the number of days with surface agglomerations is that surface agglomerations are visible to tourists from the beach. However, that does not mean that days without visible surface agglomerations automatically have lower levels of algae.

The accommodation statistics have been compared to the number of days with observed algae blooms from 1999 to 2007 (although no data is presented for 2001) (Figure 1). The year 2007 displays the lowest number of days where algae were observed of all the years in the period (1999-2007).

The most severe algae' blooms are shown in 1999, 2003, 2005 and 2006. While there are some fluctuations in the number of overnight stays in general there has been a 20% increase from 1999 to 2007.

The fluctuations can be the result of numerous factors of which algae blooms may be one. In order to shed light on the causes more research are required. There are large geographical variations and varying concentrations of cyanobacteria and therefore the observed number of days close to Öland might differ from the average number in the Baltic Sea.

Figure 1
NIGHTS SPENT IN CAMP SITES IN KALMAR COUNTY AND MAXIMUM NUMBER OF DAYS WITH OBSERVED PRESENCE OF CYANOBACTERIA, 1999-2007



Source: Composed by data from SMHI and SCB

In general, low levels of cyanobacteria, Nodularia Spumigena (NS), were noticed in the Baltic Sea in July, 2009. However, water samples reveal differences based on location and date. A pattern similar to 2009 was reported in 2007 when the levels in general were low but with variations between locations and date. These years could be compared to 2008 when the levels where higher in Kalmar Sound (Ref M1-V1) both in the beginning of July and in mid August. There is a deviation in samples from Karlsö Deep at the reference point BY38 where there were high concentrations early in July but no specimens of NS in mid august (SMHI, 2007a; SMHI, 2007b; SMHI, 2008a; SMHI, 2008b; SMHI, 2009e; SMHI, 2009f).

The length of the blooming period as calculated by numbers of days present (Figure 1), was above the average for the Baltic Sea in 2009 although the amount of cells was low. The average, (used as reference), is determined from a reference period composed by the following years starting with 1999 and ending with 2007.

Methods and data

This study is based on data that was collected through two different surveys. These surveys consisted of questionnaires which provided data about travel motives, supply of attractions and camping travel patterns, for example return visits, day trips during their stay on Öland, and also about collaborations between commercial campgrounds and surrounding or supporting attractions and development plans for the campgrounds. The first one was sent to commercial campgrounds on Öland that have camping, lodging and caravan tourism as their primary business who are members of SCR. There are 28 commercial campgrounds on Öland, including two that offer camping as a complement to their primary business and are not members of the SCR. Therefore the sample was based on the 26 campgrounds that have SCR membership and of those 24 responded. Why look at camping tourism when scrutinizing impacts from algae blooms on Öland? First, because camping tourism has a dominating position in the accommodation sector, second, the camping tourism season is closely connected to the summer months, beach-related activities and the period when harmful algae blooms (HAB) occur. Third, the campgrounds are to a great extent located on the shores of the Baltic Sea and finally, the tourism business already claims to have suffered economic losses due to HAB.

The second survey was directed towards visitors at the commercial campgrounds included in the first survey. Eight of the 26 commercial campgrounds were randomly selected and from these eight, visitors from a sampling of campsites were also randomly chosen. These 8 campgrounds provided a total of 2,013 campsites of which this survey covered a total of 201. The survey was distributed to every tenth caravan, tent or cabin and the result was a total of 112 valid inquire.

The data for this study has been analyzed by descriptive statistics presented in frequency tables. Due to the small population of commercial campgrounds and the limited sample of visitors, the use of analytical statistics would not be valid. The ambition is to show frequencies and potential comparable variations concerning camping tourism and algae blooms. The results of the data from the questionnaires were compared to accommodation statistics generated by Statistics Sweden (SCB, 2008) and maps generated by the Swedish Meteorological and Hydrological Institute (SMHI, 2009c), displaying the presence of algae blooms, specifically cyanobacteria in the Baltic Sea. The hypothesis for the study is that: there is a relation between media reports on algae blooms, the actual algae situation and number of arriving tourists. That is, if media reports predict severe HAB-events it would have a negative effect on the number of tourist arrivals.

The time period for the distribution of the questionnaires among visitors was limited to eight weeks from the middle of June to late august 2009, thereby covering both the peak season and the first weeks before and after the peak season for camping tourism on Öland. Clearly, each summer's algae situation, both in terms of actual blooms, as well as media reports on the situation, will be unique, and therefore results from this study cannot necessarily be generalized. In 2009, the weather situation on Öland was statistically "normal" for a Swedish summer. On Öland, July had the highest average

temperature and it was about 16 or 17 degrees Celsius which is the normal average in July on Öland (SMHI, 2009b). There were relatively low levels of algae present around the coastline of Öland in June, and the first three weeks of July the level of specimens increased. In late July and first two weeks of August the level of algae was low.

The algae situation might have affected the answers given in the questionnaires.

The cyanobacteria species of most interest for this study is Nodularia Spumigena. There are two reasons to monitor the Nodularia Spumigena, first, it is one of the harmful species of cyanobacteria and second, it could be used as marker for presence of harmful algae blooms. However, it should be noted that other species can also be harmful to for example the dinoflagellates. It is important to notice that in the selected cases where the concentrations of Nodularia Spumigena were low, the concentrations of other harmful algae were also low.

The results from the questionnaires have been compared to accommodation statistics and algae occurrences in the Baltic Sea in order to get a wider time perspective.

Results

PERCEPTIONS OF ALGAE BLOOMS

Out of the 112 visitors who responded to the questionnaire, 55 were male and 57 female. The median age for women was 52 years and 57 years for men. Out of 112 valid answers, 94 stated to be living in a relationship or being married and 18 stated that they were single. Compulsory school is for 38% the highest level of education, while 30% have high school education and another 29% have studied at university level. Most of the responding visitors are relatively local, as the majority live somewhere in southern Sweden. In most cases their permanent residences are located within 250 kilometres of Öland.

The questionnaire contained questions about the number of visits the respondent had made to Öland in the last ten years and the type of accommodation they chose during their previous visits. The majority had been to Öland during the last ten years and many of them repeatedly, where 90% report that they have been to Öland before and the average number of visits is 14. 25% had been to Öland 3 to 4 times during the last ten years and 50% had been to Öland more than 10 times.

A majority of the responding camping tourists seem to be loyal to their choice of destination. The number of repeat-visits among responding tourists was 101 out of 112 valid answers. Most respondents (78%) had been camping during their previous visits and many revisit the same campground.

Even though the summer of 2009 displayed relatively low rates of algae blooms the situation still received media attention. Some reports alleged the absence or presence

of blooms while others predicted either high rates or low rates. The following media reports are just a small selection of what was reported during the year 2009.

In May 20, 2009 the Swedish television reported:

"Svåraste algblomningen i Östersjön på 15 år" (Most severe algae blooms in the Baltic Sea in 15 years). (SVT, 2009).

In June 30th another report proclaimed:

"Kraftig algblomning väntas? (Will there be severe algae blooms this year?)" (Havet.nu, 2009).

July 20 the newspaper Expressen wrote:

"I år slipper vi algblomning (We won't see algae blooms this year)" (Sandqvist, 2009).

The County Government of Stockholm wrote on their webpage the sixth of August 2009 that the risk of algae blooms in August was increasing as a result of calm weather. The Headline was:

*"Ökad risk för algblomning (Increasing risk of algae blooms)" (*Länsstyrelsen i Stockholms län, 2009).

As shown above, whether or not there are algae blooms present, they still receive media attention. The results of the survey directed to the commercial campgrounds show that algae blooms and water related issues like quality and supply of water are the most important concerns for the local environment in the future, with algae blooms mentioned by 7 of the 21 campground managers. Table 1 displays the answers from one of the open questions where respondents stated their main concerns about the local environment. The results show that algae blooms are perceived to be a problem by almost half of the responding campgrounds.

Table 1
THE LARGEST ENVIRONMENTAL CONCERNS AMONG THE RESPONDENTS

Stated concerns about future environmental problems on a local scale	Frequency
Algae blooms	7
Algae blooms, water, environment	1
Exploitation of the local architecture	1
Fertilizers, oil spills, water quality	1
Air	1
Shortage of water	2
To many low quality attractions, low quality shopping and low quality restaurants	1
Changes in the water	1
Sea level	3
Deterioration of the Baltic Sea	1
The Baltic Sea, eutrophication	1
Total	19

The camping tourists on the other hand do not seem as though they would abandon Öland as a summer tourism destination in favour for other destinations with more stable weather and lower risk of algae blooms. No measurable differences are seen between the answers given during the period with media reports on the presence of algae (July and August) in the water and with those answers given when there were no media reports on visible algae (June) in the water. The questionnaire from the visitor perspective revealed that almost 30% would consider other destination options if there was a high risk of algae blooms and unstable weather (Table 2). Although the majority (69%) of the valid cases are loyal to their destination and state that they would continue to visit Öland, if the remaining 31% choose a different destination the economic effects on local businesses could be devastating.

Table 2
THE STATED INFLUENCE OF ALGAE BLOOMS ON CHOICE OF DESTINATION

Do algae blooms and/or unstable weather affect your choice of destination?	Number
I would choose Öland despite risk of algae blooms and unstable weather	71
I would choose another destination where the weather is more stable and there is a lower risk of algae blooms	32
Total	103

According to the survey, the most commonly perceived environmental threat among commercial campground was algae blooms, and more than 2/3 of the responding campgrounds claim that this affects their business. However, 7 of the campgrounds also claim that they are, or at least would be affected by an increasing number of days with rain per summer. The results of the visitors' tolerance to algae indicate that 71 of the 112 visitors who responded would visit Öland even if the risk of algae blooms was high. More than half of the respondents state that they probably would continue to visit Öland even with an increasing risk of severe algae blooms. The acceptance of unstable weather on the other hand is relatively low. Higher risk of rain might influence the tourists' decision to take other destinations under consideration. More than 50% state that they would not accept more than a maximum of two hours of rain and unstable weather per day and 13 % state that they would not accept any bad weather or rain, although they knew that there is always a risk of rain.

The majority of the responding visitors state that they would not abandon Öland because of algae blooms. Therefore these results do not indicate that algae blooms will cause the majority of camping visitors to consider other destinations instead of Öland. Nevertheless one third state that they would or might consider other destinations. Since camping tourism represents about 1.6 million overnight stays spent on Öland and in Kalmar county it means that the camping tourism business could suffer from a loss of up to 500,000 overnight stays annually. That is a clear indication that this could become a large threat to the tourism business on Öland, leading to economic losses in the future. It is important to keep in mind that these results are based on a very limited sample and the area needs to be further researched. When comparing data on algae blooms with accommodation statistics for the last decade the results follow similar

patterns, however, there is insufficient data to assert a causal relationship. Most visitors are or have been loyal to Öland but, the indications that almost 30% might consider other options along with predictions of more extreme weather events and more rain, are cause to take the future effects on local camping tourism as a result of environmental change seriously.

Conclusion

The results show some indications of how algae blooms are perceived among visitors and commercial campgrounds. It also shows that campground managers and visitor have different levels of concern regarding algae blooms.

Algae blooms can be perceived as an environmental problem for the local tourism business (Table 1) but it does not seem to cause tourism displacement. It is however important to notice, that almost 30% of the responding visitors state that they would consider other options or other destinations due to risk of severe algae blooms. This is a significant number of visitors. Algae blooms and weather conditions are important factors and have to be taken serious. Since 69% of the responding visitors state that they would visit the destination again even if there is a high risk of algae blooms, the hypothesis has to be revised. There is a negative effect that has to be considered but it does not seem to be as severe as expected. The responding visitors have experienced algae blooms before and they have been visiting the same destination repeated times. They are also in a mature age and the absence of younger visitor segments might be problematic in the future. In order to continuously attract visitors there is a need to understand why younger visitor segments are not as frequently represented.

Local environments have a crucial role to play in summer tourism destinations. Even if the standard of service and attractions is relatively high, environmental aspects are important. Destinations can in various ways experience negative impacts due to environmental change. Both real and anticipated changes have to be considered as well as the perceived large environmental threats among tourists and residents. The location of facilities and built environments for tourism use, especially in beach related tourism, is one example were campgrounds and attractions could be facing the impacts from changes in sea water levels, weather extremes or severe algae blooms. Thus there is a need for destination and campground managers, to be proactive and develop strategies and management plans for potential environmental changes.

It can be concluded that the significance of tourism as an alternative development for rural areas is evident. The reliance in tourism as a means to provide for local employment and income however, increase the vulnerability of the local livelihood system which makes it even more important to be precautious. In order to mitigate negative impacts from environmental change, destinations have to be aware of potential threats as well as how these threats or changes in the environment affect tourism.

The results of the survey show that campground managers state that the supply of surrounding attractions is very important for their business. Even so, only a few claim to

be collaborating and networking with surrounding attractions. That could be a way to provide a supply which could be more flexible and less sensitive to fluctuations in weather. However, there are no clear indications that the algae blooms would cause large adjustments or responses in the way camping tourism products are organized or managed at the camping enterprise level. Yet, surprisingly enough this research has shown that the presence of algae blooms has not induced campground managers to be proactive with regards to product development and collaboration with surrounding attractions.

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