

Article

Will Climate Change Affect the Attractiveness of Beaches? Beach Users' Perceptions in Catalonia (NW Mediterranean)

Briana Bombana ^{1,*} , Raquel Santos-Lacueva ^{2,3}  and Òscar Saladié ⁴ 

¹ SGR Interfase Research Group, Department of Geography, Autonomous University of Barcelona, Bellaterra, 08193 Cerdanyola del Vallès, Spain

² Fi Group, Recinte Industrial, 08690 Santa Coloma de Cervelló, Spain

³ Research Group on Territorial Analysis and Tourism Studies (GRATET), Rovira i Virgili University, 43003 Vila-seca, Spain

⁴ Department of Geography, Rovira i Virgili University, 43003 Vila-seca, Spain

* Correspondence: briana.bombana@uab.cat

Abstract: Considering climate is a key resource for tourism, we investigated beach users' profiles and their perceptions regarding three acknowledged effects of climate change (CC): temperature changes, reduction in beach area and water restrictions. Chosen as our case study, Catalan beaches are recognized globally as a coastal destination visited by national and international tourists as well as local residents and could, thus, shed light on potential trends. We conducted 867 surveys with users from 18 beaches classified as urban, semi-urban and natural beaches during the summer season. Questions approached three main blocks of information: sociodemographic profiles, characteristics of the stay and mobility, and perceptions regarding potential CC impacts. The results identified differences in profiles and perceptions among users of different types of beaches. Regarding CC effects, temperature changes and beach area reduction appeared to be more limiting and decisive factors than water restrictions in future scenarios, although reductions in drinking water are also less accepted. Foreigners were generally more sensitive to the effects considered, possibly due to their greater flexibility in choosing tourist destinations. Finally, the capacity of this type of approach to highlight key issues and related human behavior in future scenarios is useful for tourism management, especially subsequent adaptation options.

Keywords: climate change; beach attractiveness; beach users' perceptions; beach management; tourism management; tourism sustainability; adaptation; Catalonia; Mediterranean region



Citation: Bombana, B.; Santos-Lacueva, R.; Saladié, Ò. Will Climate Change Affect the Attractiveness of Beaches? Beach Users' Perceptions in Catalonia (NW Mediterranean). *Sustainability* **2023**, *15*, 7805. <https://doi.org/10.3390/su15107805>

Academic Editors: Jun (Justin) Li and Colin Michael Hall

Received: 15 March 2023

Revised: 27 April 2023

Accepted: 8 May 2023

Published: 10 May 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

A tourist's destination choice can be conditioned by a wide range of factors [1], and three sets of variables are taken into account: cognitive constructs, external inputs and internal inputs [2]. The last variables include, among others, the destination's resources and accessibility [3], which all influence destination attractiveness. Climate is one of the key resources for tourism destinations [4]. The interactions between climate and tourism are numerous, and climate might be a push factor for demand in source markets and a pull factor in destinations and influencing the timing of travel and seasonal demand [5]. Moreover, climate is a dominant attribute of a destination's image and attractiveness [6]. Climate also influences the management of tourism destinations and businesses, such as monitoring energy and water supplies, heating and cooling costs, seasonal closures and planning and managing outdoor activities [5].

However, the heterogeneity of the tourism sector and subsectors triggers various degrees of dependence on climatic conditions, considering the typology of activities are limited by climate (ski tourism, urban tourism, etc.). Climate conditions can be favorable to, make difficult or impede the development of a destination. Sun, sand and sea (3S) tourism is one of the most dependent on climate [7,8] and is consequently vulnerable to

climate change (CC) affecting the essential attributes: temperature (sun), beaches (sand) and marine ecosystems (sea) [9,10]. Therefore, the effects of CC on these attributes have a potential impact on the attractiveness of these destinations [11,12]. The risk of a destination losing attractiveness due to increased heat stress or reduced beach availability will depend on how the tourists are exposed to the hazard and the destination's vulnerability to that hazard [13].

In regard to the vulnerability of tourism to CC, the Mediterranean region is considered a hotspot [14]. In 2018, the European Mediterranean region was one of the most visited worldwide; tourist arrivals increased by 5% (710 million), and international tourism spending amounted to USD 570 billion [15]. Tourism is a crucial sector for the economy of many Mediterranean countries such as Spain, which is ranked second in the number of international tourists [15], with 83 million in 2019 [16], and tourism represented 12.3% of Spain's GDP in 2018 [17]. Nevertheless, tourism activity is not distributed homogeneously throughout the country but is mostly concentrated in the Mediterranean coastal regions since 3S tourism represents the predominant market. Within Spanish autonomous communities (A.C.), Catalonia receives a major portion of arrivals (23.2%) [16], and tourism represents 12% of Catalan's GDP [18]. Considering hotel occupancy [19], most tourists go to Barcelona (43.3%) and surrounding coastal destinations (49.3%). Tourist activity, especially 3S tourism, is one of the key sectors within the diversified Catalan economy. Although the COVID-19 pandemic brought tourism to a near standstill [20], in the summer of 2022, with no mobility restrictions, Catalonia's tourist numbers were similar to those of 2019 [21].

The CC situation led the Catalan Government to declare a climatic emergency in 2019 [22]. The latest projections expect changes in climatic conditions that may affect both tourism demand and offerings in Catalonia. The average temperature increase registered is highest in the summer compared to other seasons [23]. One of the most recent projections indicates an expected increase in summer temperatures of up to 2 °C by 2050 [24]. The increase will be slightly higher in the case of the maximum vs. minimum temperature [24]. Water scarcity for tourism activities and a reduction in the availability of beaches for recreation due to erosion and sea-level rise are predicted [23]. In 2010, it was estimated that 70% of Catalonia's beaches had suffered erosion [25], which has been exacerbated by a rise in sea level resulting from CC [26]. In some cases, hard engineering structures have been built in an attempt to protect beaches from erosion [27]. However, the decrease in the provision of sediments through river basins may be the central issue leading to the degradation of the landscape and the intensification of erosion further down some coastlines [28].

Several factors influence tourists' decision-making about their travel destinations. Whereas some relate to the individual tourist, others relate to the destination [2,3]. In the case of 3S tourism, three key factors are the quality of beaches, the weather/climate and the availability of water for domestic and recreational uses [29].

Different factors might influence tourists' perceptions of climate characteristics and the threats of CC. These can include the climate characteristics of the origin country [5,30], tourists' own or their friends' or relatives' previous experiences [31,32], mass media and social media [33], and individual beliefs and values [34,35]. These factors will affect the degree to which tourists are sensitive to CC and how they adapt their tourism choices. The behavioral dimension of adaptation depends on experiences and motivational and cognitive processes [35].

Agulles et al. [13] designed a set of indicators that can contribute to the increase or decrease in exposure of the tourists (age, purchasing power, profile, comfort level and origin) and the vulnerability of the destination (health system/security level, quality information, long-term planning, offer of alternative activities, dependence on source markets, overcrowding, deseasonalization and AC measure) to the hazard (heat stress and reduction of beach availability) and, for instance, its influence on the attractiveness of the destination.

Tourism management and, more specifically, adaptation strategies should consider tourists behavior. It will increase the effectiveness of the strategies designed by the public stakeholders in each destination to achieve the proposed objectives. Destinations and businesses will benefit from understanding how CC might impact tourists' activities, including their demand behavior, perceptions and expectations [4,36], because it may help them to anticipate potential changes in tourism demand geographically and seasonally [34]. The tolerance degree of demand in response to alterations regarding destinations based on CC will affect the success and sustainability of tourism activities worldwide. Nevertheless, knowledge about the complexity of tourists' responses is lacking [34,36].

In this context, the objectives of this paper are to explore: (i) the role that changes in temperature, reductions in beach area, and water restrictions, as potential CC impacts, might play in beach users' decision making and choices; (ii) different perceptions according to the sociodemographic, stay, and mobility (from lodging to the beach) characteristics of beach users, and (iii) the implications of tourists' perceptions of management adaptation strategies at destinations. After achieving the objectives, the main findings highlighted that users' concerns varied depending on the CC impact approached. Further, significant differences in perceptions were observed for each of the impacts according to users' profiles. Future temperature changes, beach area reduction and reduction in drinking water appeared to be more limiting and decisive factors than water restrictions in general. Particularly, foreigners were found to be generally more sensitive to these effects, possibly due to their greater flexibility in choosing tourist destinations. These conclusions potentially help to delineate approaches and strategies for adaptation within tourism and beach management for sustainability.

2. Materials and Methods

2.1. Study Area

Catalonia (Figure 1) received more than 19 million international tourists in 2019 [37]. Approximately 9.5 million were Spanish tourists, and 66.7% of these were from Catalonia [38]. Taking all tourists into consideration, about 49.3% were concentrated on the coastal fringe, making this part of Catalan a key attraction for tourism [19]. Coastal tourism in Catalonia is characterized by high seasonality that complicates not only the management of tourism and beaches but also public services such as waste and water management, health and transport. Tourism demand is especially concentrated during the summer, with many services closed from October to the Easter holidays.

Expanding throughout almost 600 km of coastline, the Catalan coast offers a rich diversity of landscapes and natural habitats, including a total of 280 km of beaches [39]. These beaches are distributed in its three coastal provinces from the northeast to the southeast, namely Girona, Barcelona and Tarragona. Within these, four tourism brands are respectively observed as follows: Costa Brava (17.7%), Costa de Barcelona (17.2%), Costa Daurada (12.8%) and Terres de l'Ebre (1.5%). In addition, 59% of the Catalan coast is urbanized. Excluding Delta de l'Ebre and Cap de Creus, the percentage of the urbanized coast increases to 81% [39]. This is related to the transformation derived from the boom in tourist development in the 1960s in the Spanish coastal area [40,41] and to the housing market and second-home expansion [42], although these were negatively affected by the financial crisis in 2008. A high population density is observed, totaling about 10,000 inhabitants/km² in the coastal region [39], a figure that is even higher in Barcelona's metropolitan region and during the high tourist season. Therefore, this area is significantly sensitive to the impacts of CC [23].

To reach the objectives proposed, a set of Catalan beaches (Figure 1) was selected following representative criteria for the heterogeneity of the territory considering the level of urban development: urban, semi-urban and natural beaches (Figure 2). The beach classification has been adapted from Bombana [28] and Ariza et al. [43].

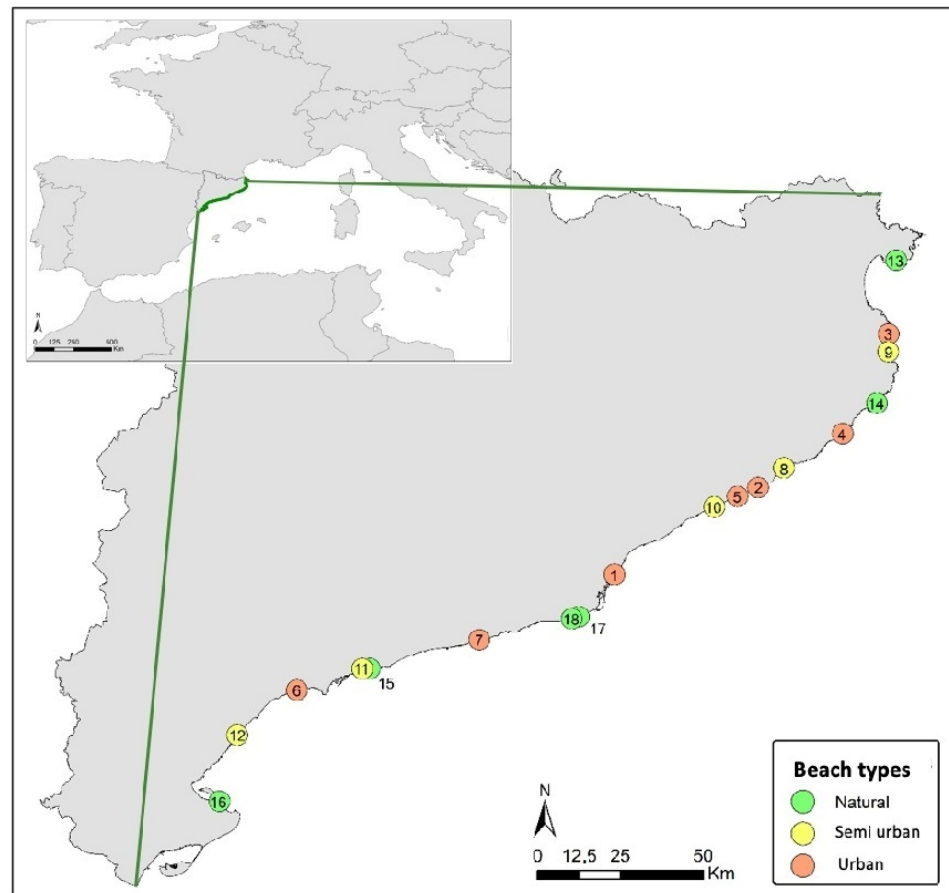


Figure 1. Location of study area and selected beaches. Source: own elaboration.

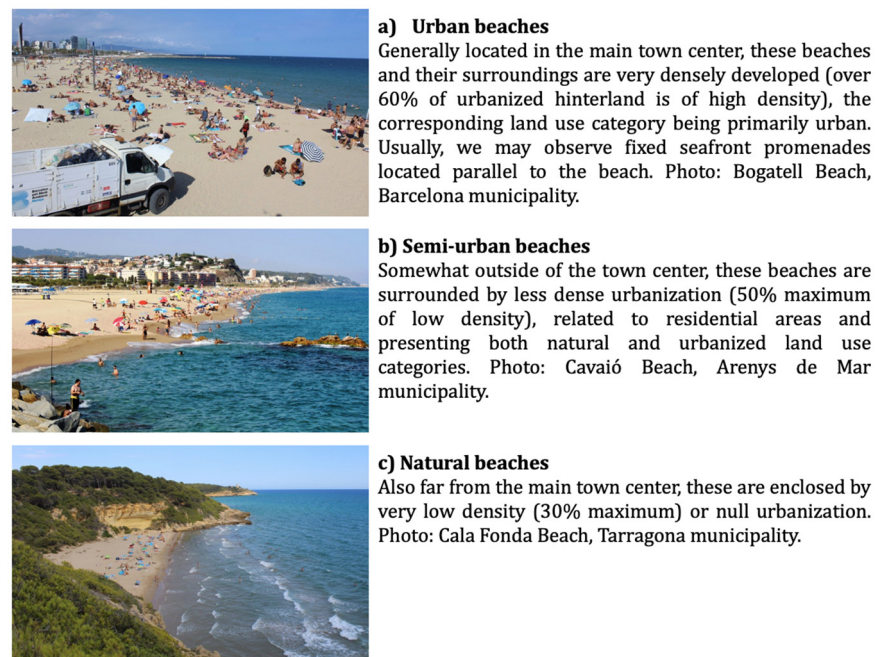


Figure 2. Beach types according to their level of development. The photos of beaches exemplify urban, semi-urban and natural beaches, respectively, referring to Bogatell (Barcelona), Cavaió (Arenys de Mar) and Cala Fonda (Tarragona) beaches. Source: Own elaboration.

2.2. Data and Methods

It is assumed that the highest usage of the Mediterranean coast occurs in July and August [44]. Thus, in the high season of 2016 in the mentioned months, 867 surveys were conducted with users of the 18 Catalan beaches shown in Figures 1 and 2, after a pilot test was conducted on a Catalan beach (i.e., Barceloneta Beach) early in July of the same year to ensure the soundness of the questions. Respondents received detailed information regarding our research, and their anonymity was guaranteed before we obtained their informed consent. Questions were adapted from other works [45–47] to obtain information about three information blocks as follows:

- (a) Block 1: Sociodemographic profiles of beach users;
- (b) Block 2: Stay and mobility characteristics of beach users;
- (c) Block 3: Users' perceptions regarding potential impacts of CC on beaches according to:
 - Temperature change (i.e., ideal temperature range and maximum acceptable temperature for going to a beach);
 - Beach area reduction (i.e., answers ranging from the currently experienced situation to 100% reduction of the beach area);
 - Water restrictions (i.e., whether they would still visit a beach if water restrictions were imposed in regard to gardens and green areas, swimming pools, ponds, fountains, and drinking water).

We mainly used multiple choice questions; however, we also included scaled questions for the temperature issues and open questions for some sociodemographic information. All questions are available in the Supplementary Materials. Table 1 shows the selected beaches by beach type.

Table 1. Distribution of beaches according to type: urban, semi-urban and natural. The name of each beach is presented followed by the corresponding municipality indicated after a comma. The numbers in brackets refer to the territorial distribution highlighted in Figure 1.

Beach Type			
Urban	Semi-Urban	Natural	Total
L'Estartit, Torroella de Montgrí (3)	Del Grau, Pals (9)	Cala Montjoi, Roses (13)	
St. Feliu de Guíxols, St. Feliu de Guíxols (4)	Santa Cristina, Lloret de Mar; i Treumal, Blanes ¹ (8)	Castell, Palamós (14)	
el Llevant, Santa Susanna (2)	Cavaió, Arenys de Mar (10)	Del Remolar, El Prat de Llobregat (17)	
Del Garbí, Calella (5)	Llarga, Tarragona (11)	De la Pineda, Viladecans (18)	
Bogatell, Barcelona (1)	L'Almadrava, Vandellòs i l'Hospitalet de l'Infant (12)	Cala Fonda i Cala Becs, Tarragona ¹ (15)	
Ribes Roges, Vilanova i la Geltrú (7)		Marquesa, Deltebre (16)	
D'en Forès, Cambrils (6)			
7	5	6	18

¹ These beaches are located beside one another and share main characteristics, particularly beach access.

Given that population of beaches can be considered infinite due to the continual inflow and outflow of users, instead of aiming at a specific number of interviewees, we applied a standard of two hours spent on each beach for two researchers to administer the surveys [45,46,48]. The researchers were accompanied and supervised by the lead author of this paper. Respondents were selected at random, and the only criterion for survey participation was being age 16 years or older. Nonetheless, in some cases, potential respondents did not wish to state their age; we considered this a conscious adult decision because the researchers targeted only those beach users who were clearly adults. Of the 867 respondents, 383 relate to urban beaches, 263 to semi-urban beaches and 221 to natural beaches. The validity of this sample was verified by cross-checking the number of surveys obtained by similar works exploring beach users' perceptions in Catalonia and elsewhere: that is, usually displaying a total number equal to or less than that approached herein e.g., [45,46,49–52].

The surveys were conducted from 10:00 to 19:00 on working days, assuming that the potential difference in the number of beach users compared to weekends is much lower during the high season. Since surveys were only conducted on sunny days, flexibility was needed to adapt the working plan and the selected locations to weather factors. Surveys were available in four languages, i.e., Spanish, Catalan, English and French, according to the general language skills of the main groups of residents and tourists arriving at the Catalan coast. In addition, it was considered that while individuals from Germany and the Netherlands could communicate in English, those from Italy could do so in Spanish [50]. After surveys were administered, the main author digitalized and verified all surveys and answers, discarding nonvalid information.

For all three blocks, the analyses followed a similar structure, first applying descriptive statistics (e.g., mean values of user opinion, standard deviation and relative percentages) to identify general profiles and preferences and, in the case of block 3, perceptions around CC impacts. After that, we grouped the responses according to beach type, aiming to draw on specific user profiles if statistically significant differences among groupings could potentially be identified. For that, we conducted Kruskal–Wallis and Dunnett’s tests with SPSS v.24. Particularly in block 3, this exercise was expanded for each of the questions referring to CC impacts in order to account for alternative groupings, i.e., differences in answers regarding age range, means of transportation used to arrive at the beach, lodging, place of residence, group structure and level of education. In reporting these outcomes, we emphasized those presenting the aforementioned significant differences.

3. Results

3.1. Sociodemographic Profiles of Beach Users

The description of the beach user profile (Table 2) comprised age, sex, level of education and origin. In general, Catalan’s beaches were visited mostly by adults 31–45 years old (34%), followed by those 46–60 years old (28%), 16–30 years old (23%) and those older than 60 (6%). The majority of respondents were female (64%). The level of education was similarly divided between bachelor, master or higher degrees (46%) and high school or college (40%), followed by elementary-level education (11%). Beach users coming from Catalonia predominated (48%), with the rest of Spain accounting for 11%, and with Madrid and Aragon being the most represented (with 3.2% and 2.1% of the total, respectively). Finally, international visitors represented a significant segment of the respondents (37%). Countries represented were France (16.7%), Germany (4.3%), the Netherlands (3.6%), Belgium (2.3%), Switzerland (1.8%), Italy and the United Kingdom (1.4% each), the Nordic countries and Russia (0.5% each), Ireland and the United States (0.2% each), Portugal (0.1%), other European countries (2.7%), other North or South American countries (0.8%) and others (0.1%).

Beyond the general profile, a user profile can be drawn based on the type of beach considered, particularly pointing to statistically significant differences ($p < 0.01$; Dunnett’s test) regarding sex between natural beaches and urban or semi-urban beaches, as well as among all beach types for each of the origin groupings. That is to say, about a third of those surveyed on urban and semi-urban beaches were women (respectively, 66% and 67%); this decreased to just over half on natural beaches (56%). In regard to origin, urban beaches were visited mostly by international users (49%) and people from Catalonia (36%); the rest of Spain contributed only 10% of the visitors to urban beaches. For semi-urban and natural beaches, most of the respondents came from Catalonia (63% and 51%, respectively), followed by international (24% and 29%, respectively) and Spanish visitors (10% and 15%, respectively).

3.2. Stay and Mobility of Beach Users

The surveys allowed descriptions of the main characteristics of beach users’ stays according to the type of lodging chosen, group structure, type of transportation used to travel to the beach and amount of time spent at the beach (Table 3). About a third of

users stayed in their main residence (32%); this percentage decreased for those staying in apartments (18%), hotels (17%), second residences (14%), campsites (12%) and other types of lodging (7%). More than half the respondents were accompanied at the beach by family members (53%), followed by those who were couples (21%), friends (16%), alone (6%) or others (5%). Motorized vehicles were the predominant means of transportation for getting to a beach (56%), although traveling to the beach on foot and by bicycle corresponded to a significant number of those surveyed (42%). Finally, the mean time spent on the beach was approximately 3.7 h (+/−1.8).

Table 2. Frequency of beach users according to their sociodemographic profile and beach type.

	Urban	Beach Type Semi-Urban	Natural	All Beaches
<i>Age (%)</i>				
16–30	30	15	20	23
31–45	29	41	35	34
46–60	24	28	34	28
>60	4	8	5	6
Did not answer	13	8	6	9
<i>Sex (%)</i>				
Female	66	67	56	64
Male	31	30	43	33
Did not answer	3	3	1	3
<i>Level of education (%)</i>				
No schooling	0	1	1	0
Elementary	12	10	10	11
High school or college	43	34	38	40
Bachelor, master or higher	42	48	49	46
Did not answer	3	4	2	3
<i>Origin (%)</i>				
Catalonia	36	63	51	48
Rest of Spain	10	10	15	11
International	49	24	29	37
Did not answer	5	3	5	4

As for distinct characteristics in user profiles according to beach type, highly significant differences ($p < 0.01$; Dunnett's test) were observed between urban beaches and semi-urban or natural beaches in regard to lodging and transportation mode groupings. Urban beaches represented similar proportions of users staying in hotels (29%) and main residences (26%), followed by apartments (21%), second residences (10%), campsites (9%) and others (5%). For semi-urban and natural beaches, main residence was the predominant type of lodging (respectively, 40% and 32%). However, in regard to the semi-urban beaches, this was followed by users staying at second residences (21%), apartments (14%), campsites (13%), hotels (6%) and others (6%). For the natural beaches, the decreasing order corresponded to apartments (17%), campsites (16%), second residences (12%), others (12%) and hotels (9%). Regarding the type of transportation used, for urban beaches, almost two-thirds of users arrived at the beach on foot or by bicycle (60%), while motorized vehicles accounted for approximately 38%. For semi-urban and natural beaches, more than two-thirds reported coming to the beach by motorized vehicle (respectively, 72% and 70%), followed by on foot and bicycle (in total, 27% and 29%, respectively). Finally, the average number of hours spent at the beach represented a highly significant difference ($p < 0.01$; Dunnett's test) between urban and semi-urban beaches.

Table 3. Beach users in Catalonia and their stay characteristics and transportation mode from lodging to the beach according to beach type.

	Urban	Beach Type Semi-Urban	Natural	All Beaches
Lodging (%)				
Main residence	26	40	34	32
Second residence	10	21	12	14
Campsite	9	13	16	12
Hotel	29	6	9	17
Apartment	21	14	17	18
Others	5	6	12	7
Group structure (%)				
Alone	5	5	8	6
Couple	19	19	25	21
Family	52	60	44	53
Friends	19	12	17	16
Others	5	5	4	5
Did not answer	0	0	1	0
Transportation mode (%)				
On foot or bicycle	60	27	29	42
Motorized vehicle	38	72	70	56
Others	2	0	2	2
Hours at the beach				
Mean	3.9	3.5	3.7	3.7
Standard deviation	1.9	1.7	1.6	1.8

3.3. Perceptions of Beach Users Regarding the Impact of CC on Coastal Destinations

The main impacts of CC on coastal destinations were summarized and approached in this study as potential changes in temperature, reduction in beach area and water restrictions, which are explained hereinafter.

3.3.1. Changes in Temperature

In regard to the question about the ideal temperature range for being at the beach, the survey results indicated an average ranging from about 24.2 °C (standard deviation: 2.8 °C) to 32 °C (SD: 3.9 °C) as the minimum and maximum temperatures, respectively (Figure 3). The temperature at which users would not come to the beach was calculated as being an average of approximately 35.6 °C (SD: 4.2 °C) (Figure 3). In general, there were no significant differences between users' answers regarding different beach types, except for minimum temperatures between urban (24.5 °C average) and semi-urban (23.8 °C average) beaches ($p < 0.05$; Dunnett's test).

When assessing these data according to origin and mode of transportation used to arrive at the beach (Figure 4), significant differences ($p < 0.05$; Dunnett's test) for minimum and maximum temperatures were found between people coming from Catalonia (minimum: 24 °C, SD 2.8 °C; maximum: 31.7 °C, SD 4 °C) and foreigners (minimum: 24.7 °C, SD 2.7 °C; maximum: 32.7 °C, SD 3.7 °C), as well as between people from other parts of Spain (minimum: 23.5 °C, SD 2.8 °C; maximum: 31.6 °C, SD 4 °C) and foreigners. This analysis emphasizes foreigners' preference for higher minimum and maximum average temperatures. Regarding the temperature at which they would not come to a beach, respondents from Catalonia differed significantly (36.3 °C, SD 4.1 °C) ($p < 0.05$; Dunnett's test) from other A.C. (35.1 °C, SD 4.3 °C) and people coming from abroad (35 °C, SD 4.1 °C), with the former being more tolerant to higher temperatures. In regard to mode of transportation, significant differences ($p < 0.05$; Dunnett's test) for maximum temperatures were observed only between those using active transport (32.3 °C, SD 3.8 °C) and motorized vehicles (31.6 °C, SD 4 °C). That is to say, lower maximum temperatures are preferred by users who came to beaches in motorized vehicles, which conforms to about 70% on semi-urban and natural beaches and almost 40% on urban beaches.

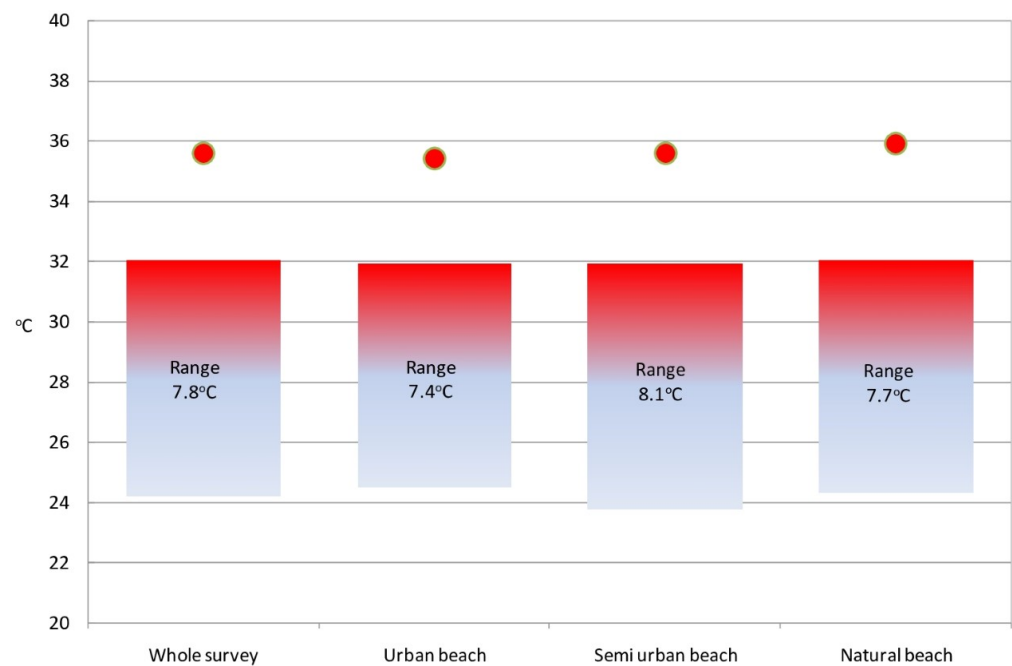


Figure 3. Ideal average range of temperature according to users, indicated by the rectangles, and the average temperature at which users would not come to a beach, indicated by the red dots. The y axis corresponds to temperature values in degrees Celsius.

It is worth mentioning that users' ages were found to be an important factor for determining their perceptions regarding maximum temperatures. The youngest respondents selected higher values ($p < 0.05$; Dunnett's test), i.e., 32.7 °C (SD 4 °C), compared to those ages 31–45 years, 32 °C (SD 4 °C); ages 46–60, 31.6 °C (SD 3.7 °C); and those over 60 years of age, 30.6 °C (SD 2.8 °C). In addition, lodging groupings showed significant differences regarding the minimum temperature perception between those staying at main residences (23.8 °C, SD 2.8 °C) and those staying at apartments (24.8 °C, SD 2.8 °C), as well as in regard to the temperature at which they would stop coming to beach: main residents (36.4 °C, SD 4.4 °C) and those staying at campsites (34.5 °C, SD 4.5 °C) or hotels (35.1 °C, SD 4 °C). Finally, no significant differences were observed in regard to sex.

3.3.2. Potential Reduction in Beach Area

Responses regarding the percentage of beach reduction that users would tolerate before they would stop visiting a beach in the future (Table 4) showed that, in general, about 40% are very sensitive to potential reductions in beach areas, and another 40% are moderately sensitive. The less sensitive accounted for only 12% of beach users. In regard to urban beaches in particular, 50% of users were very sensitive to this issue, while almost a third of the respondents (32.9%) would not tolerate any loss in beach area. Following these results, moderately sensitive respondents predominated in semi-urban (50.6%) and natural (42.6%) beaches, although less in the latter type of beach, where the highest proportion of people who were less sensitive to a potential loss (16.3%) among beach types was also observed. The proportion of highly sensitive respondents was similar for semi-urban and natural beaches at 32.3% and 33.5%, respectively.

Regarding the other criteria (Table 5), significant differences were observed between people coming from Catalonia and the other two categories of origin, as well as between other A.C. and tourists from abroad. No significant differences were observed in relation to sex. In general, sensitivity increases from those with a Catalan origin (at 23.1% very sensitive) to those from abroad (at 65.2% very sensitive), with those from other regions of Spain in a mean term (36.9% being very sensitive). By contrast, respondents coming from other A.C. are less sensitive (25.4%), followed by Catalan origin (19%) and, finally,

foreigners (5.7%). Regarding lodging, significant differences were observed between the following categories: (i) main and second residences, (ii) main residence and campsite, (iii) main residence and hotel, (iv) main residence and apartment, (v) main residence and others, (vi) second residence and hotel, and (vii) second residence and apartment. It is noteworthy that less-sensitive people were staying at a second residence (20.1%) or at their main residence (16.4%), while those most sensitive were staying in hotels (58.2% very sensitive), followed by apartments (50.4%) and campsites (49.5%). The highest proportion of those whose response was “moderate” was registered in second-residence respondents (47.5%), followed similarly by main residence (41%) and others (40.3%). When looking at the results according to the mode of transportation used, the category “others” corresponded to few responses compared to other categories, and thus, it is not considered. High sensitivity in regard to beach reduction is particularly observed among those using active modes of transportation (50.5%), while the highest proportion of “moderate” responses was found among beach users travelling in motorized vehicles (45.9%).

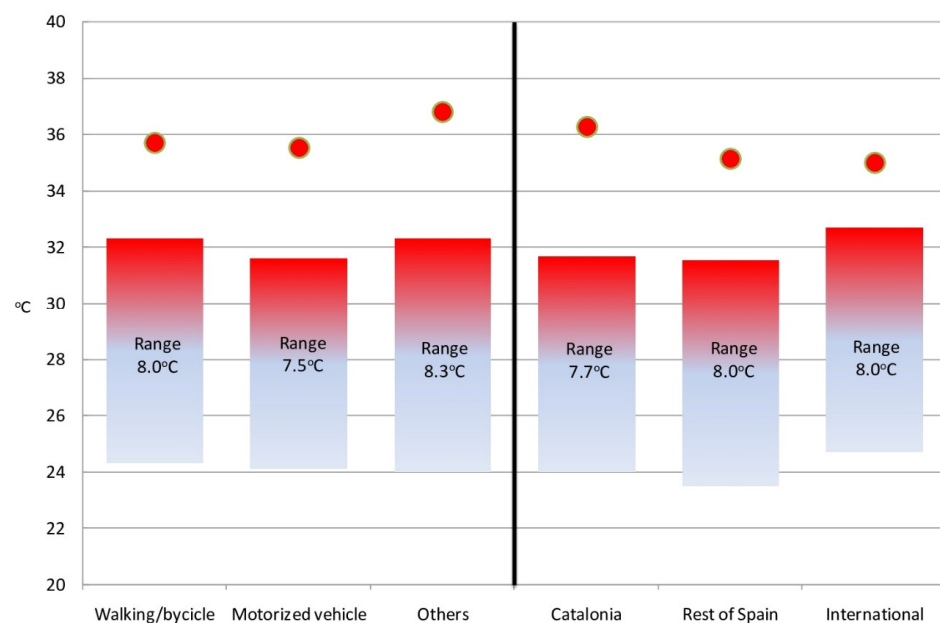


Figure 4. Ideal average range of temperature, indicated by the rectangles, and the average temperature at which users would not come to a beach, indicated by the red dots. Left side of the graph: origin groupings. Right side: mode of transportation groupings. The y axis corresponds to temperature values in degrees Celsius.

Table 4. Percentage of beach reduction that users would tolerate before they would stop visiting a beach in the future, according to types of beaches.

Degree of Sensitiveness (%)	Beach Types		All Beaches Natural	
	Urban	Semi-Urban		
Very sensitive (No loss up to 15%)	50.7 ¹	32.3 ²	33.5 ³	40.7 ⁴
Moderate (15% up to 50%)	32.4	50.6	42.5	40.5
Less sensitive (50% to no beach)	10.4	11.0	16.3	12.1
DK/DA	6.5	6.1	7.7	6.7
Total	100	100	100	100

Total percentages corresponding to those who answered “No loss”: ¹ 32.9%, ² 14.4%, ³ 19.9%, ⁴ 24%.

Table 5. Percentage of beach reduction that users would tolerate before they would stop coming to a beach in the future, according to origin, lodging and transportation mode.

	Very Sensitive	Moderate	Less Sensitive	Didn't Answer/Did Not Know	Total
<i>Origin</i>					
Catalonia	23.1	50.5	19.0	7.5	100
Rest of Spain	36.9	53.3	25.4	1.1	100
Abroad	65.2	25.4	5.7	1.1	100
<i>Lodging</i>					
Main residence	38.5	41	16.4	4.1	100
Second residence	23	47.5	20.1	9.4	100
Campsite	49.5	36.6	7	6.9	100
Hotel	58.2	31.5	4.2	6.2	100
Apartment	50.4	39.4	7.1	3.2	100
Others	46.7	40.3	8	4.8	100
<i>Transportation</i>					
On foot/bicycle	50.5	32.5	10.1	6.8	100
Motorized vehicle	33.6	45.9	13.7	6.8	100
Others	30.8	61.5	7.7	0	100

Based on these responses, it is possible to establish a standard profile for high sensitivity, particularly in the urban context; these were primarily international tourists arriving at the beach on foot or by bicycle. In contrast, the less sensitive are those staying in second and main residences; coming from Spain, particularly from other A.C.; and using a motorized vehicle to travel to and from the beach.

3.3.3. Water Restrictions

As a third CC effect, only a third of users indicated that they would not come to coastal municipalities if water restrictions due to a drought were enforced. This finding is represented by the orange-colored areas in Figure 5, with no significant differences between beach types or sex. Drinking water, in particular, was the most important restricting factor for all groupings (33.1% would stop coming), followed by swimming pools and ponds (15.6%) and water irrigation (13.3%).

Following the general consensus, drinking water continued to be the most important restricting factor for all groupings (Figure 6). Significant differences were identified among people coming from other A.C. (48.9% would stop coming) and those from Catalonia (33.7%) or abroad (29.9%), as well as between people ages 31–45 (27.8% would stop coming) and older than 60 years (52.1%), and main residents (23.7% would stop coming) and others (38.7%). In regard to restrictions related to water irrigation, significant differences were observed between users from Catalonia (11.1% would stop coming) and abroad (17%), and between those 31–45 years old (17.1% would stop coming) and 46–60 years old (9.9%). As for swimming pools and ponds, significant differences were verified only between respondents from Catalonia (12.5% would stop coming) and foreigners (19.8%). The results for water irrigation, swimming pools/ponds and drinking water did not present significant differences in relation to mode of transportation. A general profile, however, may be described in which general low-to-moderate sensitivity to water restrictions increases with age, at least for water irrigation and drinking water. In addition, those staying in main or second residences and coming from Catalonia or other regions of Spain indicated that they are less sensitive to restrictions in water for irrigation or for pools and ponds. However, these groups were found to be the most sensitive to a potential lack of drinking water.

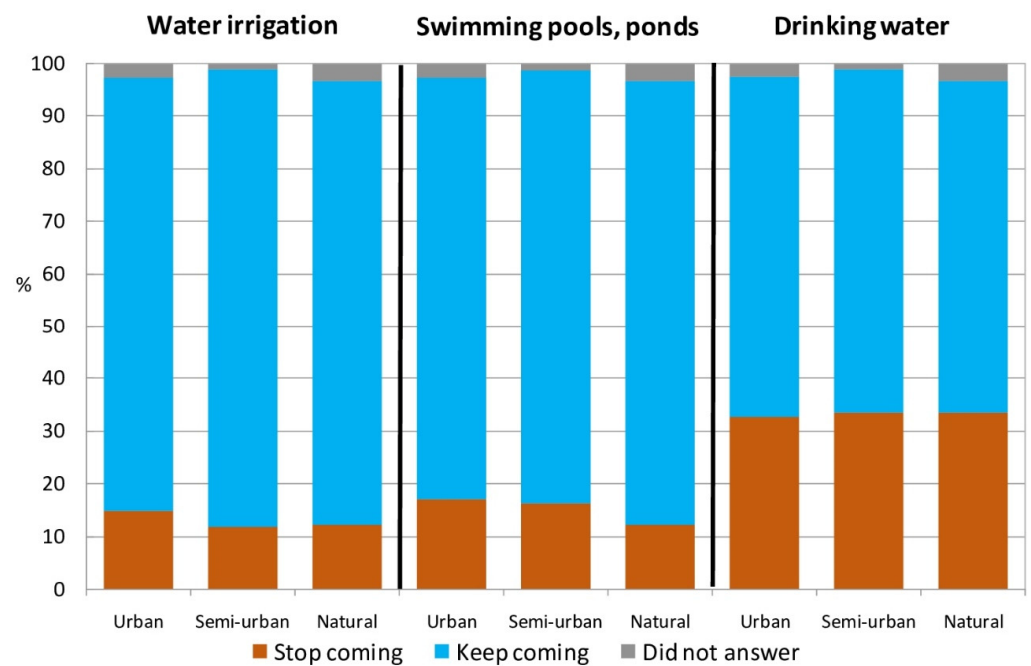


Figure 5. Users' tolerance regarding water restrictions due to a drought in each of the beach types analyzed.

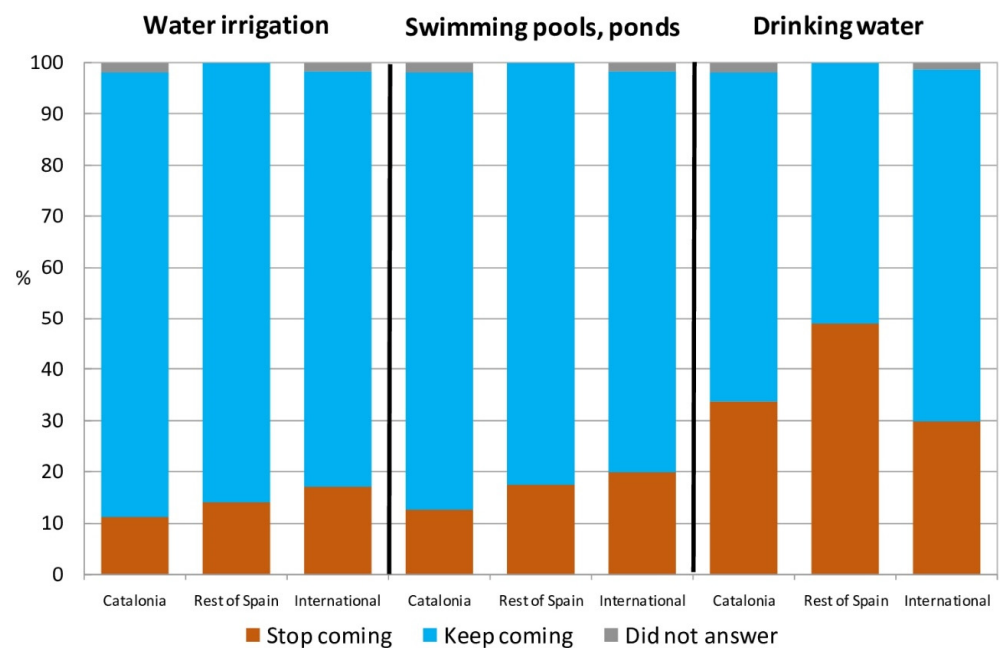


Figure 6. Users' tolerance regarding water restrictions due to a drought according to their origin.

4. Discussion and Conclusions

This research reveals outstanding insights regarding, on the one hand, the profiles of beach users in Catalonia and, on the other, beach users' perceptions and potential adaptive behaviors regarding CC. These findings constitute crucial information for coastal and tourism management and are discussed in the following subsections.

4.1. Profile, Stay and Mobility of Beach Users in Catalonia

First, regarding the sociodemographic characteristic of age, the results are mostly similar to those found in other studies conducted in Catalonia [50,51], except for a lower average percentage of youth (less than 30 years old). In regard to origin, despite the

percentage of Spanish visitors being similar to that previously found for Catalan beaches, foreigners represented a generally higher percentage as opposed to a decrease in the proportion of users from Catalonia [50,51]. However, the latter maintained predominance among all origin groupings. Regarding international tourists, France maintained its position as the country of origin for most international tourists coming to the area [37], perhaps mainly due to its geographical closeness to Catalonia.

Foreign origin is believed to be particularly important regarding urban beaches [50–52] because international visitors are able to find better transport connections and higher offers for services and facilities [53]. By contrast, some studies have indicated that residents are usually more likely to prefer natural assets [12], which may partially explain their highest attendance at semi-urban (73% from Spain, in general) or natural (66% from Spain, in general) beaches.

Second, considering the type of lodging and mobility from the accommodation to the beach, we point out several issues. Somewhat related to the percentage observed for users from Catalonia and Spain, those staying at main and second residences comprised almost half of the survey respondents. These types of lodging were particularly important for semi-urban beaches, with about 61% of responses and higher than the 30% observed by [50]. Other types of lodging refer mainly to hotels, campgrounds and rented apartments. Similar to other results found in Catalonia [50], our findings show that the latter three are especially higher for urban beaches (59% of responses), where the highest percentage of internationals was also noted.

As for the mentioned study conducted in Catalonia [50], family accounted for the most numerous groupings, followed by couples, friends and persons travelling alone. Nonetheless, in this work, the former represented a higher proportion, while slightly fewer were couples and friends. Although not significantly different but possibly indicating a slight trend, natural beaches were found to have the highest proportion of people coming alone or as couples compared to other beach types, partially because they value “peacefulness, freedom and distance from urban and developed sites” to the detriment of social interaction [50] (p. 10), [51]. By contrast, semi-urban and urban beaches had similar percentages regarding type of group, except for friends and family, which were, respectively, marginally more preferred by users of urban and semi-urban beaches. For those coming with children, the choice of beaches has been attributed to greater offers of services and facilities, i.e., urban and semi-urban beaches [53,54].

A higher proportion of people used motorized vehicles to get to beaches than those using active means of transportation. Nonetheless, considering the types of beaches, respondents on urban beaches differ significantly from those at semi-urban and natural beaches since 60% of users arrived at the beach on foot or by bicycle, as similarly observed [50]. Alternatives to cars (e.g., public buses and bicycles) as modes of transportation are not encouraged at semi-urban and, particularly, natural beaches to the same extent as urban beaches [53].

Finally, the number of hours spent at the beach was similar among all three types of beaches studied, which can be linked to the fact that comfort quality for users does not vary significantly among beach types in Catalonia [53].

4.2. Beach Users' Perceptions of Impacts of CC and Potential Adaptative Behaviors

CC is now considered a reality for populations in general. Nonetheless, in this study, when jointly analyzing the three key questions, although a general moderate sensitivity is observed, we found that CC impacts may limit users' beach visits. This relates to another study in which 23% of tourists would not tolerate CC impacts on beaches, highlighting a special concern regarding the conditions in these environments above others, whereas about 30% of tourists are known to be willing to visit tourist destinations despite CC impacts [55]. Considering different CC impacts, however, very different perceptions are shown as discussed hereinafter; changes in temperature and beach area reduction appeared to be more limiting and decisive factors than water restrictions in future CC scenarios.

Regarding the temperature factor, during summers in Catalonia (1971–2000), maximum average temperatures ranged around 26.8 and 27.1 °C [24], significantly lower than the ideal maximum average temperature of 32 °C (SD: 3.9 °C) and the average threshold temperature at which tourists would stop coming to the beach (35.6 °C; SD: 4.2 °C). Despite this dissonance favoring good weather for beach users, they refer to average temperatures, not emphasizing daily peak temperatures that would be felt by beach users, especially if considering an expected increase in summer temperatures up to 2 °C by 2050 [24]. Notably, this projection is slightly higher in the case of maximum temperatures than minimum temperatures [24]. Record high temperatures have been reported in recent years, particularly in the summer of 2022, which has been called “the hottest ever registered” [56], calling attention to ongoing changes in extreme temperatures.

Moreover, the ideal temperature range defined by the survey, i.e., an average of 24.2 °C (SD 2.8 °C) to 32 °C (SD 3.9 °C), and an unaccepted maximum temperature of 35.6 °C (SD: 4.2 °C) varied from other references [57], except in the case of the maximum ideal temperature. In the mentioned study [57], respondents defined ideal temperatures as between 27 °C and 32 °C, with greater than 37 °C being identified as unacceptably hot. These differences are possibly explained by the climatic conditions of countries of origin influencing the respondents’ perception. That is, respondents comprised only students from Northern European countries who were not used to a Mediterranean climate and were not located at the beach when the survey was conducted. In our study, unacceptable maximum temperatures differed significantly according to origin, emphasizing that those living in Catalonia or other parts of Spain and linked to main or second residences were more tolerant of temperature changes. In this sense, foreigners are more likely to seek higher minimum temperatures, and lower temperatures would stop them from visiting beaches, possibly because residents would be more restricted in their choice of destination if they already live near the beach. Climatic characteristics of destinations are important but are not the only factor involved in choosing a destination [57]. Further research in this area should consider not only atmospheric temperature changes but also the reasons justifying respondents’ answers and changes in water temperature, wind speed and precipitation, with implications for sunny/cloudy hours, given that weather comfort on beaches is associated with all the variables discussed [58], as well as the tourism climatic index [59].

Concerning the potential reduction in beach area, most respondents were found to be very or moderately sensitive to this CC impact, accounting for more than 80% of the responses; this may emphasize the high value of beach area for tourism. Some inferences are further drawn from the standard profile of most sensitive users established herein; that is, internationals (65.2% very sensitive) normally stay at hotels, apartments and campgrounds and attend urban beaches via active modes of transportation. Due to their higher flexibility in choosing a summer destination alternative to Catalonia, since they usually do not own residences in this region and could lodge elsewhere, they are likely to be more restrictive if minimum beach area expectations are not met, alternatively opting for destinations with greater beach area. On the other hand, the number of users from Catalonia and, in particular, other parts of Spain showing low sensitiveness (between 20 to 25%) somewhat corroborates observations in which about 30% of visitors would go to a destination despite CC effects [57].

These outcomes should be additionally analyzed in relation to the feeling of overcrowding that increases on beaches where there are multiple users and limited sand surface, possibly influencing sensitivity [60]. As such, not only the high sensitivity profile observed on urban beaches (approximately 50% indicating being very sensitive), as well as the highest proportion of responses emphasizing low sensitivity on natural beaches could be partially explained by the fact that on urban beaches a lower availability of space may be encountered related to average overcrowding and more services and facilities provided [53]. Furthermore, reductions in beach areas in Catalonia are a current reality, although they are mainly associated with particular beaches and unusual events (e.g., storms) [53].

Water is a basic resource for human development and all kinds of activities, including coastal tourism. Nevertheless, this is not a very sensitive issue for beach users. In a specific coastal region of Catalonia (i.e., Llobregat Delta), besides there being no differences observed between visitors and residents contrasting with our study, greater concerns about the impacts of CC on society were reported compared to the impacts felt by users personally. They were even lower when users were confronted with specified effects on the region of concern [12]. The difference between societal and personal or local impacts can be partially attributed to users' beliefs that CC is less serious for a particular coastline than for the world in general [61]. These results could help to explain why the respondents in the present study did not feel so sensitive when presented with precise local CC impacts, as in the case of potential water restrictions. This perception further agrees with Agulles et al. [13] who interviewed public and private stakeholders in the tourism sector and the academia and found that other factors, such as the typology of tourists and capacity to adapt, may be more important than the CC effect itself. This includes, for example, assuming that tourists could purchase drinking water if there is a decrease in availability.

Additionally, considering water as a basic resource, it seems reasonable that no significant differences are found when comparing the responses regarding this factor according to beach typology. The main concern is drinking water restrictions, and the percentage of people who reported that they would not return to the destination in the event of drinking water restrictions was similar in the three types of beaches. By contrast, the differences are statistically significant when the origins of the tourists are considered. Those from Catalonia and other regions of Spain are less sensitive to restrictions regarding water for irrigation or pools and ponds. However, these respondents were the most sensitive to a potential lack of drinking water.

In general, perceptions varied between the type of impact and tourist origin. Foreigners were found to be more sensitive to temperature changes, beach area reduction, and water restriction for pools, ponds and irrigation, while Spanish visitors, notably those coming from other A.C., were more sensitive to restrictions in regard to water for drinking. As mentioned, these results may be related to the flexibility foreigners have when choosing tourist destinations compared to people from Catalonia and other Spanish A.C. because most of them stay in their main or second home, thereby limiting their choice of beaches. In other words, if Catalan destinations do not meet the characteristics sought by foreigners (not only climatic) these tourists can change their destination choice more easily than main or second residents.

Finally, concern about impacts associated with CC should be approached not only through the projected hazard (e.g., beach reduction), but also exposure (e.g., typology of beach users) and vulnerability (e.g., capacity to employ adaptation strategies) as factors influencing perception. People and institutions may acknowledge and adapt to these changes differently [13]. Further, particularly considering users' typologies and responsibilities, detachment between global and local awareness was important in other studies [12,61]. Diversified alternatives are further highlighted, such as the willingness of tourists to pay a supplementary fee on tourist packages for environmental sustainability [34]. Governments might consider taxing tourists as an opportunity, with the revenue designated to address the impacts of CC, such as drought, massive algae or jellyfish proliferation, or beach erosion.

5. Concluding Remarks and Implications

In this study, queries regarding beach users' perception of CC were developed along the Catalan coast (NW Mediterranean). From the analysis, it was possible to delineate a general profile of visitors, particularly according to beach types, despite no significant differences being present among the groupings regarding some sociodemographic and stay characteristics. The approach to the general profile and observed significant differences within groupings set the scene to later approach perceptions around CC impacts and point out the most critical issues accordingly. In past years, a great importance was assigned to

CC in Catalonia and worldwide. Nevertheless, only a few references have enquired about beach users' perceptions in this regard; we trust this study can contribute to this topic.

First, we conclude that most visitors to Catalan beaches are adults 31–60 years old, widely presenting a high level of education (beyond a college degree) and visiting with family. As expected, due to close geographical proximity, Spanish A.C. were the main places of origin observed, especially Catalonia. Associated with this, lodging predominantly occurred in main or second residences. Women were more prompted to answer the survey and accounted for the majority of respondents. Insofar as beach types were considered, we should emphasize that the youngest foreigners lodging at hotels and people coming to beaches with active modes of transportation stand out at urban beaches. At semi-urban beaches, we highlight that the highest percentage of users are from Catalonia, staying at main and second residences, accompanied by family members, and using motorized vehicles. Natural beaches were generally more similar to semi-urban beaches but were distinguished for having the highest number of people aged 46–60 years, alone or in a couple, staying at campsites and originating from Spanish A.C. other than Catalonia, and opposingly, had the lowest percentage of women observed.

Results obtained on CC effects indicate different concerns depending on each effect. First, there is a wide concern regarding beach area reduction, to which a larger part of those surveyed presented high or moderate sensitivity; which helped to emphasize the high value of beach area for 3S tourism. At the same time, water restrictions were found to be important to less than a third of the users consulted. The highest proportion of these visitors was associated with drinking water concerns, and fewer with swimming pools, ponds and water irrigation. As for temperature, at first glance, people would accept changes that are greater than expected CC projections. Nonetheless these projections relate to average temperatures, which could dilute extreme temperatures. By establishing a standard profile of those not tolerant or low-tolerant to beach area reduction, we highlight mainly foreigners who stand out at urban beaches, arriving on active modes of transportation and lodge at hotels or apartments. Decoupling those worried about water restrictions, people coming from Spanish A.C. are more sensitive to drinking water and, opposingly, less sensitive to other types of water restrictions than foreigners. As for temperature, international visitors are less tolerant to higher-limit temperatures and lower minimum temperatures, displaying a stricter range of temperature acceptance. Hence, despite CC effects appearing to concern both tourists and residents, the former are less flexible about such changes, partly because they can simply choose another destination instead of Catalonia. Moreover, we should consider that the usual conditions of the countries of origin may influence respondents' perceptions.

This paper is especially important for beach and tourism management. It provides a method to portray visitors' preferences and perceptions of CC, as well as their tolerance of events regarding CC projections. The findings represent core information for decision-makers and medium- and long-term planning for sustainability, emphasizing the role of users' perceptions in influencing the design of better aligned adaptation options. Coastal tourism destinations should consider not only CC projections but also the adaptative capacity of the demand, which, as we stated, shows changes according to the sociodemographic characteristics and type of lodging/transport. An even more important consideration is destinations that are dependent on specific international markets; these should aim to implement diversification strategies in the short term. Hence, we should recognize adaptation as a function of collective thinking, as it is more likely to be accepted and developed when peoples' opinions, preferences and needs are considered.

Lastly, future research should analyze other coastal destinations to compare the results regarding the adaptative capacities of different kinds of tourists. After observing tourists to be part of different groups, the reasons behind users' choices could also be investigated, including their perceptions varying between local and global impacts, to shed light on awareness-raising campaigns. Other types of destinations, such as mountainous areas, rural or urban, also exposed to CC, should be studied. Moreover, future research might

approach other impacts of CC on tourism, including extreme weather events such as rainfall or heat waves.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su15107805/s1>, The user survey model applied in this study.

Author Contributions: Conceptualization, B.B. and R.S.-L.; methodology, B.B. and R.S.-L.; formal analysis, B.B. and Ö.S.; investigation, B.B., R.S.-L. and Ö.S.; resources, B.B., R.S.-L. and Ö.S.; data curation, B.B.; writing—original draft preparation, B.B., R.S.-L. and Ö.S.; writing—review and editing, B.B.; supervision, Ö.S. All authors have read and agreed to the published version of the manuscript.

Funding: The first author had the support of the Ministério da Educação (Brazil) by a CAPES Fellowship (99999.001355/2015–05). This research was developed under the framework of the POLICLIMA project (CSO2016-76842-C2-1-R) and is part of the R+D+i project ADAPTOUR (contract number PID2020-112525RB-I00) funded by MCIN/AEI/10.13039/501100011033 (Spain).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: All subjects involved in the study provided their informed consent in the printed version of the survey used to inquire about our research questions.

Data Availability Statement: By answering the survey header (Supplementary Material), all subjects gave their informed consent for inclusion before they participated in the study. For that, they were previously informed that their anonymity and confidentiality would be assured, the reason why the research was being conducted, and how their data would be used.

Acknowledgments: All authors acknowledge the centrality and sincerely thank all the participants of this study. The authors would also like to thank those trainee students and colleagues who assisted the planning or development of the fieldtrips to the Catalan beaches, as well as the researcher who helped us with the statistical analyses.

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of the data; in the writing of the manuscript; or in the decision to publish the results.

References

- Um, S.; Crompton, J.L. Development of pleasure travel attitude dimensions. *Ann. Tour. Res.* **1991**, *18*, 374–378. [\[CrossRef\]](#)
- Decrop, A.; Snelders, D. Planning the summer vacation. An adaptable process. *Ann. Tour. Res.* **2005**, *31*, 1008–1030. [\[CrossRef\]](#)
- Crouch, G.I.; Ritchie, R.B. Application of the analytic hierarchy process to tourism choice and decision making: A review and illustration applied to destination competitiveness. *Tour. Anal.* **2005**, *10*, 17–25. [\[CrossRef\]](#)
- Becken, S. The importance of climate and weather for tourism: Literature review. *LEaP Land Environ. People* **2010**. Available online: <https://researcharchive.lincoln.ac.nz/handle/10182/2920> (accessed on 23 August 2022).
- Scott, D.; Lemieux, C. Weather and Climate Information for Tourism. *Procedia Environmental Sciences* **2010**, *1*, 146–183. [\[CrossRef\]](#)
- Hamilton, J.M.; Lau, M.A. The role of climate information in tourist destination choice decision making. In *Tourism and Global Environmental Change*; Gössling, S., Hall, C.M., Eds.; Routledge: London, UK, 2005; pp. 229–250.
- Jones, A.; Phillips, M. *Disappearing Destinations: Climate Change and Future Challenges for Coastal Tourism*; Cabi: Oxfordshire, UK, 2011.
- Santos-Lacueva, R.; Anton Clavé, S.; Saladié, Ò. The vulnerability of coastal tourism destinations to climate change: The usefulness of policy analysis. *Sustainability* **2017**, *9*, 2062. [\[CrossRef\]](#)
- IPCC. Key economic sectors and services. In *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectorial Aspects*; Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC; Cambridge University Press: Cambridge, UK, 2014; pp. 659–708.
- Simpson, M.C.; Gössling, S.; Scott, D.; Hall, C.M.; Gladin, E. *Climate Change, Adaptation and Mitigation in the Tourism Sector: Frameworks, Tools and Practices*; UNEP: Paris, France, 2008.
- Wang, W.-C.; Lin, C.-H.; Lu, W.-B.; Lee, S.-H. When destination attractiveness shifts in response to climate change: Tourists' adaptation intention in Taiwan's Kenting National Park. *Curr. Issues Tour.* **2019**, *22*, 522–543. [\[CrossRef\]](#)
- Meo, B.; Graham, S.; Ariza, E.; Casellas, A.; Delfino, D. The resident and visitor gaze: A comparison of coastal social values at risk due to sea-level rise. *Environ. Sci. Policy* **2021**, *129*, 202–209. [\[CrossRef\]](#)
- Agulles, M.; Melo-Aguilar, C.; Jordà, G. Risk of loss of tourism attractiveness in the Western Mediterranean under climate change. *Front. Clim.* **2022**, *4*, 1019892. [\[CrossRef\]](#)
- UNWTO; UNEP. *Climate Change and Tourism: Responding to Global Challenges*; UNWTO: Madrid, Spain, 2008.
- UNWTO. *International Tourism Highlights*; UNWTO: Madrid, Spain, 2019. [\[CrossRef\]](#)

16. INE. Movimientos Turísticos en Fronteras. 2019. Available online: <https://www.ine.es/jaxiT3/Tabla.htm?t=10823> (accessed on 23 August 2022).
17. INE. Cuenta Satélite del Turismo 2018. 2019. Available online: https://www.ine.es/dyngs/INEbase/es/operacion.htm?c=estadistica_C&cid=1254736169169&menu=ultiDatos&idp=1254735576863 (accessed on 18 August 2022).
18. IDESCAT. PIB. Por Sectores. A Precios Corrientes. 2022. Available online: <https://www.idescat.cat/indicadors/?id=aec&n=15332&lang=es> (accessed on 7 September 2022).
19. IDESCAT. Ocupación en Establecimientos Hoteleros 2019: Marcas Turísticas. 2019. Available online: <https://www.idescat.cat/pub/?id=aec&n=552&lang=es> (accessed on 7 September 2022).
20. Brouder, P. Reset redux: Possible evolutionary pathways towards the transformation of tourism in a COVID-19 world. *Tour. Geogr.* **2020**, *22*, 484–490. [CrossRef]
21. Diari Ara. El Turisme es Recupera Però Sense Canvi de Model. 2022. Available online: https://www.ara.cat/editorial/turisme-recupera-canvi-model-editorial-diari-ara-25-agost-2022_129_4469600.html (accessed on 9 September 2022).
22. GenCat. El Govern Declara Formalment L'emergència Climàtica. 2019. Available online: <https://govern.cat/salaprensa/notes-premsa/355322/govern-declara-formalment-emergencia-climatica> (accessed on 19 August 2022).
23. IEC—Institut d'Estudis Catalans. Tercer Informe Sobre el Canvi Climàtic a Catalunya. 2016. Available online: <http://cads.gencat.cat/ca/detalls/detallarticle/Tercer-informe-sobre-el-canvi-climatic-a-Catalunya-00003> (accessed on 9 September 2022).
24. SMC—Servei Meteorològic de Catalunya. Avanç de Les Projeccions Climàtiques Regionalitzades a 1 km de Resolució Per a Catalunya 1971–2050 (ESCAT-2020). 2020. Available online: https://canvclimatic.gencat.cat/web/.content/03_AMBITS/adaptacio/ESCACC_2021_2030/Previa-Resultats-ESCAT2020_versio1.pdf (accessed on 9 September 2022).
25. ICGC—Institut Cartogràfic i Geològic de Catalunya. Llibre Verd de L'estat de la Zona Costanera a Catalunya. 2010. Available online: <https://icgc.cat/Administracio-i-empresa/Serveis/Riscos-geologics/Dinamica-de-la-costa/Llibre-verd-de-l-Estat-de-la-zona-costanera-a-Catalunya-2010/Llibre-verd-de-l-Estat-de-la-zona-costanera-a-Catalunya-2010> (accessed on 9 September 2022).
26. Zorrakino, D. La Generalitat Declara la Emergència Climàtica y se Compromete a Mitigarla. 2019. Available online: <https://www.europapress.es/catalunya/noticia-generalitat-declara-emergencia-climatica-compromete-mitigarla-20190514153314.html> (accessed on 16 July 2019).
27. Sanò, M.; Jiménez, J.; Medina, R.; Stanica, A.; Sanchez-Arcilla, A.; Trumbic, I. The role of coastal setbacks in the context of coastal erosion and climate change. *Ocean. Coast. Manag.* **2011**, *54*, 943–950. [CrossRef]
28. Bombana, B. Co-Production of Indexes of Beach Management in the Catalan Coast: A Double-Loop Process of Learning. Ph.D. Thesis, Universitat Autònoma de Barcelona, Cerdanyola del Vallès, Spain, 2019.
29. Gössling, S.; Hall, C.M. Uncertainties in predicting tourist flows under scenarios of climate change. *Clim. Chang.* **2006**, *79*, 163–173. [CrossRef]
30. Lohmann, M.; Hübner, A.C. Tourists' weather perceptions and weather related behavior. A qualitative pilot study with holiday tourists to Martinique. *Études Caribéennes* **2011**, *19*, 141685156. [CrossRef]
31. Spence, A.; Poortinga, W.; Butler, C.; Pidgeon, N.F. Perceptions of climate change and willingness to save energy related to flood experience. *Nat. Clim. Chang.* **2011**, *1*, 46–49. [CrossRef]
32. Broomell, S.B.; Budescu, D.V.; Por, H.H. Personal experience with climate change predicts intentions to act. *Glob. Environ. Chang.* **2015**, *32*, 67–73. [CrossRef]
33. Gómez-Martín, M.B.; Armesto-López, X.; Amelung, B. Tourism, climate change and the mass media: The representation of the issue in Spain. *Curr. Issues Tour.* **2016**, *19*, 174–198. [CrossRef]
34. Clemente, F.; António, L.; Vitor, A. Tourists' Perceptions on Climate Change in Lisbon Region. *Atmosphere* **2020**, *11*, 297. [CrossRef]
35. Scott, D.; Hall, C.M.; Gössling, S. *Tourism and Climate Change: Impacts, Adaptation and Mitigation*; Routledge: London, UK, 2012.
36. Lin, C.H.; Wang, W.C.; Ou, S.J. Impact of comparative climate change perceptions on antecedents of tourists' adaptation intentions for a coastal destination in Taiwan. *J. Sustain. Tour.* **2021**, *30*, 69–88. [CrossRef]
37. IDESCAT. Turistas Extranjeros con Destino Principal en Cataluña. 2019. Available online: [https://www.idescat.cat/visor/?id=turist&lang=es&dataset=10&tc=true&tm=factor_ind_factor_tur,tasa_absoluta_tur,tasa_relativa_tur&td=t.any,terr.ccaa,proc.proc&tf=t.any\[2019\]&ccc=true&cm=factor_ind_factor_tur,tasa_absoluta_tur,tasa_relativa_tur&cd=t.any,terr.ccaa,proc.proc&cf=t.any\[2019\]&filters=temps_24054.2019&filters=territori_emtf_25077.09&rows=n4_emtf_dim_pais_agr_25073&columns=concept](https://www.idescat.cat/visor/?id=turist&lang=es&dataset=10&tc=true&tm=factor_ind_factor_tur,tasa_absoluta_tur,tasa_relativa_tur&td=t.any,terr.ccaa,proc.proc&tf=t.any[2019]&ccc=true&cm=factor_ind_factor_tur,tasa_absoluta_tur,tasa_relativa_tur&cd=t.any,terr.ccaa,proc.proc&cf=t.any[2019]&filters=temps_24054.2019&filters=territori_emtf_25077.09&rows=n4_emtf_dim_pais_agr_25073&columns=concept) (accessed on 16 November 2019).
38. IDESCAT. Ocupación Turística. 2019. Available online: <https://www.idescat.cat/pub/?id=aec&n=119&lang=es> (accessed on 16 November 2019).
39. Department of Territory and Sustainability. Configuració del Litoral Català. 2020. Available online: https://territori.gencat.cat/ca/06_territori_i_urbanisme/costes_i_muntanya/la_costa_catalana/la_costa_catalana/ (accessed on 16 November 2019).
40. Martí, C. La Transformació del Paisatge Litoral de la Costa Brava: Anàlisi de L'evolució (1956–2003), Diagnosi de L'estat Actual I Prognosi de Futur. Ph.D. Thesis, University of Girona, Girona, Spain, 2005.
41. Vergés, M. Tourism in Alt Maresme: Historical perspective and future challenges. In Proceedings of the 6th Conference of the International Forum on Urbanism, Barcelona, Spain, 25–27 January 2012.
42. Borrell Merlin, M.D. Las políticas de medioambiente en la UE y el litoral mediterráneo español. *Obs. Medioambient.* **2007**, *10*, 325–337.

43. Ariza, E.; Jiménez, J.A.; Sardá, R. A critical assessment of beach management on the Catalan coast. *Ocean. Coast. Manag.* **2008**, *51*, 141–160. [[CrossRef](#)]
44. Ariza, E.; Jiménez, J.; Sardá, R. Seasonal evolution of beach waste and litter during the bathing season on the Catalan coast. *Waste Manag.* **2008**, *28*, 2604–2613. [[CrossRef](#)] [[PubMed](#)]
45. Peña-Alonso, C. Diseño y Aplicación de Indicadores de Vulnerabilidad y Calidad Para Playas y Dunas de Canarias: Una Propuesta Metodológica. Ph.D. Thesis, Universidad de las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain, 2015.
46. Peña-Alonso, C.; Ariza, E.; Hernández-Calvento, L.; Pérez-Chacón, E. Exploring multi-dimensional recreational quality of beach socio-ecological systems in the Canary Islands (Spain). *Tour. Manag.* **2018**, *64*, 303–313. [[CrossRef](#)]
47. Ruddy, M.; Scott, D. Will the Mediterranean Become “Too Hot” for Tourism? A Reassessment. *Tour. Hosp. Plan. Dev.* **2010**, *7*, 267–281. [[CrossRef](#)]
48. Hernandez-Sampieri, R.; Fernandez-Collado, C.; Baptista-Lucio, P. *Metodología de la Investigación*; Editorial Mc Graw Hill: Mexico City, Mexico, 2010.
49. Botero, C.M.; Anfuso, G.; Williams, A.T.; Zielinski, S.; da Silva, C.P.; Cervantes, O.; Silva, L.; Cabrera, J.A. Reasons for beach choice: European and Caribbean perspectives. *J. Coast. Res.* **2013**, *65* (Suppl. S1), 880–885. [[CrossRef](#)]
50. Roca, E.; Villares, M. Public perceptions for evaluating beach quality in urban and semi-natural environments. *Ocean. Coast. Manag.* **2008**, *51*, 314–329. [[CrossRef](#)]
51. Roca, E.; Villares, M.; Ortego, M.I. Assessing public perceptions on beach quality according to beach users’ profile: A case study in the Costa Brava (Spain). *Tour. Manag.* **2009**, *30*, 598–607. [[CrossRef](#)]
52. Lozoya, J.P.; Sardá, R.; Jiménez, J. Users expectations and the need for differential beach management frameworks along the Costa Brava: Urban vs. natural protected beaches. *Land Use Policy* **2014**, *38*, 397–414. [[CrossRef](#)]
53. Bombana, B.; Garcia-Lozano, C.; Pintó, J.; Ariza, E. Multi-Dimensional assessment of beach systems on the Catalan coast from a pragmatic and epistemological perspective. *Ecol. Complex.* **2021**, *45*, 100907. [[CrossRef](#)]
54. Cabezas-Rabadán, C.; Rodilla, M.; Pardo-Pascual, J.E.; Herrera-Racionero, P. Assessing users’ expectations and perceptions on different beach types and the need for diverse management frameworks along the Western Mediterranean. *Land Use Policy* **2019**, *81*, 219–231. [[CrossRef](#)]
55. Lam-González, Y.E.; Galindo, C.G.; Hernández, M.M.G.; León, C.J. Understanding the Heterogeneity of Tourists’ Choices under Climate Change Risks: A Segmentation Analysis. *Atmosphere* **2021**, *12*, 22. [[CrossRef](#)]
56. Rteve. L’estiu 2022, el Més Calorós Registrat a Catalunya. 2022. Available online: <https://www.rtve.es/television/20220912/lestiu-2022-mes-caloros-registrat-catalunya/2401861.shtml> (accessed on 9 November 2022).
57. Gössling, S.; Bredberg, M.; Randow, A.; Sandström, E.; Svensson, P. Tourist Perceptions of Climate Change: A Study of International Tourists in Zanzibar. *Curr. Issues Tour.* **2006**, *9*, 419–435. [[CrossRef](#)]
58. Bombana, B.; Ariza, E. A double-loop process for beach quality index construction: Approaching the complexity of the Catalan coast. *J. Environ. Manag.* **2019**, *240*, 177–189. [[CrossRef](#)] [[PubMed](#)]
59. Matzarakis, A. Weather-and climate-related information for tourism. *Tour. Hosp. Plan. Dev.* **2006**, *3*, 99–115. [[CrossRef](#)]
60. Valdemoro, H.I.; Jiménez, J.A. The influence of shoreline dynamics on the use and exploitation of Mediterranean tourist beaches. *Coast. Manag.* **2006**, *34*, 405–423. [[CrossRef](#)]
61. Kreller, A.M. Transforming fair decision-making about sea-level rise in cities: The values and beliefs of residents in Botany Bay, Australia. *Environ. Values* **2021**, *30*, 7–42. [[CrossRef](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.