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Public perception of beach quality: lessons learnt from a French case study

Virginie DUVAT

Professor in Coastal Geography

UMR LIENSs University of la Rochelle-CNRS 7266

Institut du Littoral et de l'Environnement

2, rue Olympe de Gouges

17 000 La Rochelle - FRANCE

virginie.duvat@univ-lr.fr

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Introduction

Quality-based coastal policies and relating scientific studies have emerged and developed firstly in English speaking countries, in particular in the United Kingdom where the pioneer works of R. Morgan's team started in the 1990's and rapidly became a worldwide example, and secondly in Spanish speaking countries (notably in Spain, Mexico and Colombia) that have made significant progress over the two past decades (Morgan & Williams, 1995; Morgan, 1999; Cendrero & Fischer, 1997; Nelson *et al*, 2000; Cendrero *et al.*, 2003; Botero, 2003; Micallef *et al.*, 2004; Cervantes & Espejel, 2008; Roca & Villares, 2008).

A quality-based policy can be defined as a public policy aimed to reach sustainable development through the implementation of a territorial project focussing on quality, which includes both environmental quality (condition of ecosystems and resources, quality of landscape and the living environment) and quality of the tourist experience (heritage value, amenities provided, information delivered). Such a project is based on the idea that improving quality can be a shared goal for all stakeholders (decision-makers, practitioners, economic actors, NGOs and users) and therefore, a relevant lever to achieve Integrated Coastal Zone Management. Indeed, such policies have proved to be highly valuable for beach management as they are holistic (incorporating all issues), systemic (inclusion of feedback effects) and dynamic (ability to include new requirements). In most quality-based policies, public perception is considered as a main lever to improve quality.

Quality-based approaches remain poorly considered in France where coastal management is still largely based on conservation policies. In such a context, the recent launching of a quality-based policy on the biggest island of the French Atlantic coast, Oléron Island, is of great interest, all the more that it is meant to support ICZM implementation on the basis of a high level of integration between science and management. This policy led to the design of a Coastal Quality Action Plan implemented in 2007 that considers public perception of beach quality as a main lever for beach quality improvement.

From this actual trial, this paper will address the following questions: why, when and how to integrate beach perception assessment in quality-based policies? How can beach perception studies bring a practical support to their implementation? We will present the study area, expose the methodology applied in the Qualibeach research programme meant to support the Oléron Coastal Quality Action Plan, at last and expose the results obtained, insisting both on user perceptions and preferences and on their main implications for beach management.

1. Study area

1.1. General presentation

Oléron Island is the largest island on the French Atlantic coast (fig.1). It belongs to the Poitou-Charentes region and to the Marennes Oléron District comprising two communities of municipalities, the Marennes Basin (7 municipalities) located on the mainland and Oléron Island (8 municipalities). This island covers 175 km² and has a low elevation (highest point: 32 metres)

as it is made of wetlands and sand dunes that have formed on its rocky substratum. Its shoreline is about 80 km long, 56 km of which are sandy with rocky outcrops and the remaining 24 km muddy. The island officially counts 40 beaches, 16 of which are considered as main beaches (security post and facilities) and 24 as secondary beaches (few amenities).

Its 20,991 inhabitants mainly concentrate in central and eastern municipalities due to the proximity of the mainland. Traditionally, they lived on rural activities including agriculture, shell farming (oysters and mussels) and fishing. The primary sector still plays a major role as La Cotinière fishing harbour is one the top ten on the French Atlantic coast and local oysters are exported throughout the world. In the 1960s, a bridge was built that linked the island to the mainland, which led both to population growth and the rapid development of tourism and recreational activities. Although most dunal and wetland habitats are protected (Natura 2000 network; natural area of ecology, fauna and flora interest; protected dune forest...), developments have contributed to ecosystem degradation. In most areas, dunes are affected by rapid natural erosion (1 to 20 m/year) that has been aggravated by anthropogenic factors (urbanization, vegetation destruction, disruption of sediment transport...).

Because it plays a crucial role in tourism development, the quality of the natural environment has become a major area of concern for public authorities. After decades of unplanned development, they initiated a participative process aimed to design a sustainable territorial strategy. This process has led to the adoption of a Sustainable Development Charter in 2004. In 2005, a Territorial Coherence Plan was adopted that sets out the main objectives to be reached. Its implementation is based on four action plans devoted to coastal quality, landscape preservation, transportation and housing, respectively.

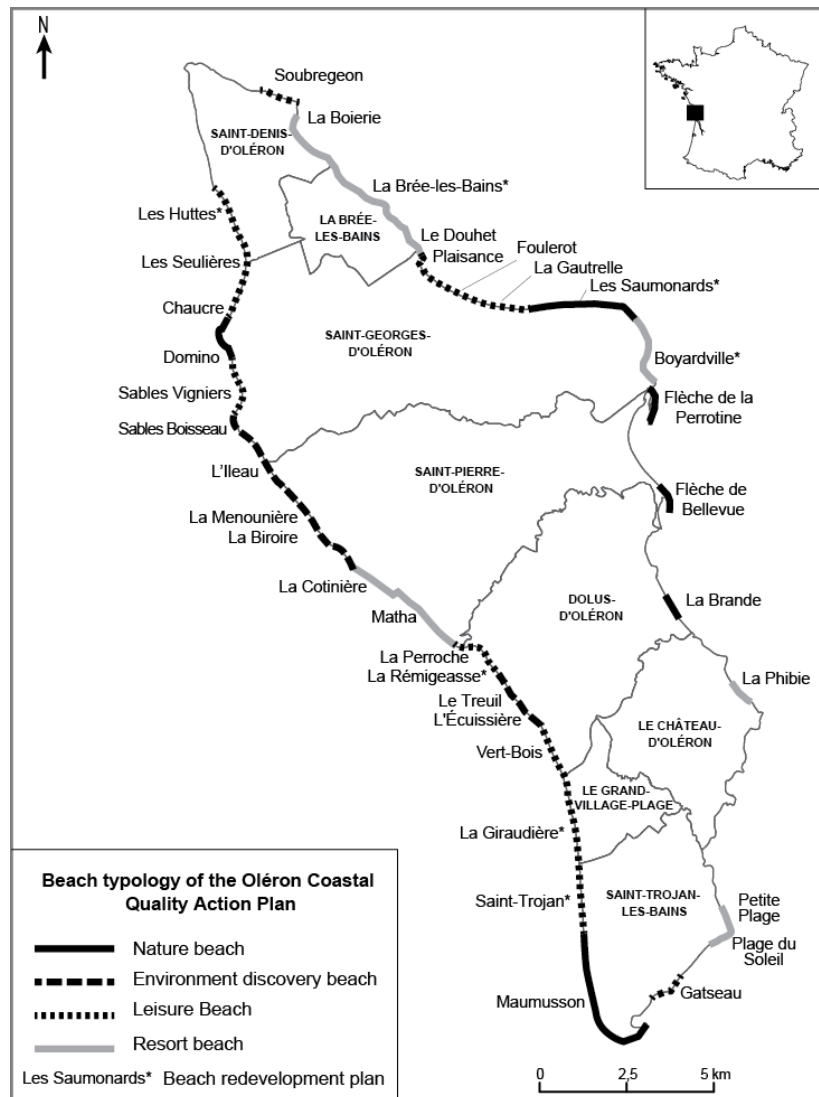


Figure 1 - Location map and beach typology of Oléron Island

1.2. Oléron Island Coastal Quality Action Plan

Adopted in 2007, the Oléron Island Coastal Quality Action Plan is held by the Community of municipalities of the island. Its implementation is based on a management committee that gathers stakeholders and makes decisions. This Plan aims to strengthen the preservation of coastal ecosystems without obstructing tourism development. The way to achieve this goal is the promotion of a balanced development of the island, based on the improvement of facilities and services in urban environments and, conversely, on their limitation in sparsely populated and natural areas. On the basis of a preliminary diagnosis highlighting variations in beach frequentation and anthropogenic impacts, a beach typology was elaborated that distinguishes *nature*, *recreation*, *discovery*, and *resort* beach types¹ (fig.1). A Beach Charter was designed that outlines the environmental guidelines and planning principles applying to the various beach types (materials authorized for soil revetment and facilities' construction, protection measures...). This Plan is implemented through beach site development or redevelopment. Mayors have to submit any beach development project to the management committee for

¹ These four beach types are defined as followed. A *nature beach* has a very strong natural character and therefore requires conservation with a greater or lesser degree of access restriction, and with little or no facilities. An *environment discovery beach* is also of natural character, but it does not necessarily require access limitation. It must have few facilities. This type mainly includes rocky or muddy tidal flats. A *leisure beach* is very busy, relatively remote from an urban centre and it attracts all customer categories. It has limited facilities. A *resort beach* is located near an urban centre and therefore it benefits from significant amenities, largely geared to families.

approval. A project can only be approved if it is compliant with the Beach Charter philosophy, planning principles and technical recommendations. Once approved, the project gains financial support (Duvat, 2011).

In the design phase of the territorial project, the lack of scientific knowledge and assistance to stakeholders from the scientific community was identified as a major shortcoming for the implementation of public policies. This problem was addressed through the co-building and funding of the research programme Qualibeach intended to assist policy-makers and practitioners in the implementation of the Plan. This programme includes three areas of study. The first concerns environmental quality, which is studied from three perspectives, physical quality (state of the beach/dune system), sanitary quality (pollution of bathing water and waste) and ecological quality (condition of ecosystems, with a special attention paid to coastal dunes and foreshores). The second focuses on visitor reception quality, which is defined as meeting the expectations and preferences of users within the regulatory boundaries and reference frameworks set by stakeholders. The third involves the quality of the visitor's experience, including landscape quality, the quality of the conditions for tourism and leisure activities (depending as much on natural factors, such as climatic or hydrodynamic, as on the facilities and security at the sites), and the quality of the ambiance, understood as the material or moral atmosphere surrounding visitors.

1.3. Role of beach perception in the Oléron Island Coastal Quality Action Plan

In these three areas of study, a special attention is paid to public perception as it can act as a major lever to improve beach quality. Indeed, public perception studies are needed to improve environmental protection in frequented tourist areas exposed to high anthropogenic impacts. Determining what users know about the sensitivity of ecosystems and processes at work is crucial to design appropriate preservation measures. New regulations or awareness raising activities may be required to reduce human impacts and their efficiency will be all the higher that they are based on a good understanding of user perceptions. The second reason for considering the knowledge of user perceptions as a major lever for the success of quality-based policies is that it reveals public expectations and preferences that can only be met if they are first properly identified. The ignorance of visitor preferences may lead public authorities to over/underestimate the importance of such and such facility or service, or to design inappropriate beach models, as public expectations vary depending on user categories (De Ruyck *et al.*, 1995; Ergin *et al.*, 2003; Pereira *et al.*, 2003; Roca & Villares, 2008). Identifying what users know about their environment is also required to improve safety. For example, visitors must be aware of currents and war remains to be safe on French Atlantic beaches.

2. Methods

2.1. A five step process to assess beach quality

The methodological protocol elaborated in the Qualibeach research programme comprises five steps. It relies on the idea that beach perception constitutes a major area of research and that it cannot be investigated separately from beach frequentation and characteristics.

Step 1 - Demarcation of beach sites

The demarcation of beach sites is required to determine which area has to be included into the study to assist beach management in a coherent way. The extent of beach sites depend both on physical (dune width, notably) and anthropogenic factors (mainly urbanization extent and beach facilities). At Oléron Island, beach sites comprise 5 successive areas from the land to the sea: the access road to the beach; the parking area(s); the footpath(s) crossing the dune; the beach itself; the bathing and water activities area (fig.2).

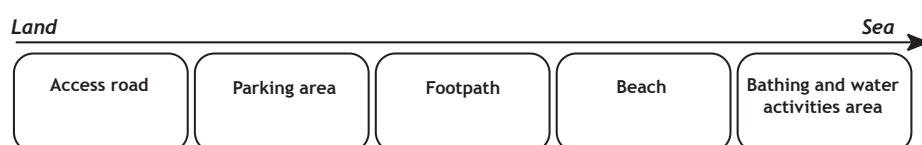


Figure 2 - Zoning applied in the Qualibeach research programme

This zoning is used both for frequentation studies and beach sites description.

Step 2 - Beach frequentation evaluation

The determination of beach frequentation is required to plan site organization and facilities, and to guarantee visitor safety. It also influences beach quality perception.

Area of study	Methods used	Results obtained
Peak days <i>3 days during the peak season</i>	<ul style="list-style-type: none"> - Counting of vehicles at the entrance of the beach road - Counting of visitor entrance and departure at beach access (per hour) 	<ul style="list-style-type: none"> - Maximum number of vehicles at the beach site - Frequentation curve per hour - Distribution of vehicles per type - Geographical origin of visitors (number plate) - Occupancy rate of vehicles - Variation of beach users numbers per hour - Arrivals and departures per hour - Dominant groups (<i>families and/or friends; lone adult; adult with child; elders; teenagers</i>)
Peak hours (4-5 pm) <i>3 days during the peak season</i>	- Counting of beach users on the beach site	<ul style="list-style-type: none"> - Maximum number of beach users - Lengthwise and crosswise distribution of beach users - Main activities - Beach facilities brought by beach users

Step 3 - Beach description: protection status, organization and reception conditions

A detailed description of beach sites is required to manage them properly, to identify problems and to plan redevelopments. Beach site description covers nine fields that all influence beach quality perception.

Area of study	Methods used	Results obtained
Protection status	Synthesis of existing data obtained from institutions in charge of environmental protection	Land status, institutions/organizations in charge of beach site management, nature and limits of protected areas
Beach site organization	Field observations and aerial photographs analysis	Large-scale map showing accessibility, parking areas, facilities, services, activity zoning
Natural features*	Existing data + field observations	Morphology, substratum, shoreline evolution, organic deposits, water and beach pollution
Activities*	Field observations	Frequentation, activities, activity organization and zoning
Accessibility**	Existing data + field observations	Accessibility conditions for all types of vehicles and visitors
Parking conditions***	Existing data + field observations	Parking conditions (revetment, organization, number of parking spaces for all types of vehicles and visitors)
Facilities****	Field observations	Detailed description of all facilities concerning waste management, visitors' movements, security, comfort and communications
Signage*****	Field observations	Detailed description of signage concerning traffic, general information, environmental protection
Regulations*****	Existing data + field observations	Detailed description

*Apply to the beach and the bathing and water activities area; **Apply to the access road; ***Apply to access road, parking area and footpath; ****Apply to all areas except the bathing and water activities area; *****Apply to all areas

Step 4 - Beach user profiles

Beach user profiles were determined through questionnaire surveys conducted on all of the 40 beaches. Short questionnaires were realized on secondary beaches that include visitor status (tourist, main or secondary resident, day-tripper), place of residence, reasons for choice of beach, frequency of visit to the island and beach, transport used. Detailed questionnaires were

conducted on the main beaches that incorporate complementary information on user coastal practices, both in general (frequency, period, places frequented), at Oléron Island (reason for visiting the island, frequency of visit) and on the beach where the survey is conducted (frequency of visit, time and duration of visit, main activities).

Step 5 - Beach quality perception

Beach quality perception was investigated through various series of questionnaire surveys. Between 2008 and 2010, 1776 questionnaires were submitted to beach users, 1439 on main beaches (between 20 and 217 questionnaires/beach, depending on frequentation) and 339 on secondary beaches (5 to 25 questionnaires/beach). The number of questionnaires realized on each beach is proportional to frequentation and representative of beach users as all categories of visitors were questioned. Considering that residents were insufficiently represented in surveys, due to the fact that they rarely visit beaches in summer, 201 additional questionnaires were made between March and June 2009 in public places (market, school, activity clubs...).

Given the fact that no survey had been made prior to this study and that the number of questions to be submitted to users was high, it was decided to make two survey campaigns. The first (544 questionnaires) mainly consisted in determining: (1) user preferences concerning natural features (beach size and materials, shoreline evolution, presence of pebbles and algae...), beach accessibility (traffic conditions, parking area organization...), and facilities, signage and services (sanitary conditions, information delivered, catering and shops, sports clubs...); (2) the respective roles they attribute to natural and human assets in beach attractiveness (interest for natural/developed beach sites; drivers of heritage value); (3) landscape quality (impact of natural and anthropogenic elements on landscape quality); (4) their understanding of the drivers of beach quality; (5) their opinion on the recent evolution of beach quality.

Considering the relative homogeneity of the results obtained, it was decided to focus the second questionnaire on place-specific facts relating to beach quality (appreciation by users of the quality of a given beach and identification of its driving factors), on the impact of particular attributes on beach quality perception (engineering works, usage conflicts, waste management problems, sporting/cultural events...) and on the opinion of users on redevelopment projects. As a result, the two questionnaires delivered complementary results and provided a good understanding of beach quality perception and beach users preferences and expectations both at island and beach scale.

2.2. Schedule and contents of beach perception studies

Questionnaire surveys were conducted between August 2008 (questionnaire 1) and August 2010 (questionnaire 2 completed during summers 2009 and 2010).

The schedule of the second series of surveys (questionnaire 2) was established in close collaboration with stakeholders in order to coordinate the realization of place-specific surveys with the schedule of beach redevelopment projects. Indeed, as they went along in the design of beach development/redevelopment plans, stakeholders needed to get user opinion both on beach problems and on planned redevelopment actions. The coordination of scientific work with management actions enabled the continuous integration of scientific knowledge into the decision-making process.

As a result, some beach perception studies were conducted *prior to the implementation of beach redevelopment plans*. They provided stakeholders with the opinion of beach users on planned redevelopments. They also aimed to collect the needs of specific user categories, such as elderly people, families with young children or surfers. Other beach perception studies were carried out *after the realization of redevelopment plans* so as to gather public opinion on change. They concerned the sites where the public had not been consulted prior to redevelopment actions. They indicate to which extent redevelopments meet visitor expectations. A third type of beach perception study was undertaken to get public opinion on *site development models*. So far, such studies have dealt with *resort* and *leisure* beaches as some of them were redeveloped. They aim to check the popularity of the typical beach models that could become standard.

3. Results

Here, we will focus on the results concerning the perception of beach quality and give an overview of the main conclusions of our studies. As tourist and resident expectations proved to be quite similar, they will not be distinguished in the following sections.

3.1. Beach quality perception

3.1.1. Drivers of beach quality

According to Oléron Island beach users, the four main factors that influence beach quality are coastal landscapes (23,7% of answers), environmental quality (21%), defined as the absence or almost absence of pollution and real preservation of fauna and flora, quiet (15%) and beach natural characteristics (10%). These results are consistent with those of previous studies (Nelson *et al.*, 2000; Ergin *et al.*, 2006; Micallef *et al.*, 2004; Roca & Villares, 2008). They confirm that on most beaches, users pay less attention to facilities than to natural assets.

Beach users were asked to evaluate the impact (*positive, negative or neutral*) of 16 anthropogenic elements on the quality of the landscape. The most appreciated elements (> 75% of answers are *positive*) are lighthouses, forts, sailing and fishing boats. On the opposite, the elements that are considered to have a negative impact on the landscape (> 75% of answers are *negative*) are industries, commercial harbours, oil tankers and container ships. In addition, 67% consider that parking areas also alter landscape quality. Opinions are divided concerning three elements: urban areas, wind farms, shops and restaurants.

The highest heritage value is attributed to natural elements (65%) compared to the cultural ones (35%). The five most valuable elements are, in descending order, dunes, landscapes, harbours, seabirds and the environment considered as a whole. The importance of seabirds is due to their abundance and diversity in the area, which is one of the major seabirds spots in Europe. Most of the cited elements are natural, which confirms the predominance of environmental assets in beach quality.

60% of users consider that beach quality has increased in recent years due both to public awareness and efforts made by public authorities to improve beaches cleaning. According to visitors, the main two factors contributing to beach degradation are pollution (44% of answers) and direct impacts of beach users (42%).

3.1.2. Preferences of beach users

Beach users care a lot about the physical characteristics of beaches, admitting that they play a major role in the quality of their visit. The most important elements are the beach width and beach materials. Indeed, for 76,7% of beach users, the beach width is crucial as it determines whether they will have enough space or not to rest and practice sports activities. Moreover, 70% of beach users prefer fine to medium and coarse sand against 30% who appreciate medium sand because it does not fly in windy conditions. Sand quality is considered to be the main factor influencing beach comfort by 75% of visitors. Pebbles are considered as a major constraint by 60% of beach users where they form ridges or sheets as they are uncomfortable and can be a source of danger both on beaches and in the bathing area. In the same way, algae accumulations are considered to reduce significantly beach quality by 74% of users because they attract insects and smell bad, and because it is unpleasant to walk on them. On the contrary, shoreline receding signs (scarps and cliffs, vegetation destruction...) and rocky outcrops do not really mind to beach users: 80% of visitors consider that coastal erosion is a natural process that does not affect beach quality, and another 60% say that they are not disturbed by the presence of rocky outcrops on the foreshore. On another hand, beach users are sensitive to the presence of flora and fauna on the coast. Thus, the dune vegetation is important for 60% of visitors and the same proportion appreciate seeing seabirds. The presence of crustaceans and shells is also highly appreciated by the public, as shellfish collection is an important activity on the Atlantic coast. Although 80% of beach users say that they feel concerned about coastal waters quality, more than 50% only appreciate it with their own eyes. Actually, more users (34% against 10%) collect information on meteorological conditions and tide than on water quality before they visit a beach. Two-thirds of beach users declare that they read the information that is provided at the beach entrance.

Concerning beach facilities, users care about the presence and numbers of toilets, bins and showers. On the contrary, they do not really mind about picnic tables although some families use them at lunchtime. Half of visitors appreciate to find catering, at least snack bars, in the surrounding of a beach. The presence of a security post is of the highest importance for 60% of beach users who consider it as the main driver of beach safety.

3.1.3. Appreciation of redevelopment plans

The results obtained when evaluating beach redevelopment plans are uneven. At some sites, the public is satisfied with redevelopment proposals even where some options such as car park removal were thought by practitioners to be unpopular. On that point, further investigations and the test of a bus service to the southern beaches during the summer of 2010 confirmed that visitors are prepared to use bicycles or public transport if car access is limited. Other case studies have shown that some redevelopment projects do not meet user demand and may be rejected if realized. An interesting point is that beach users globally appreciate the natural character of the island and do not want it to be lost, even in the most urbanized areas.

3.1.4. Appreciation of beach development models

The results obtained show that the public is generally satisfied with the beach development models proposed by public authorities.

3.2. Main implications for beach quality improvement

3.2.1. Impact of user perceptions on the success of the Coastal Quality Action Plan

On the whole, the results obtained have shown that the Oléron Coastal Quality Action Plan meets visitor expectations and will therefore get the support of the public. Some assessments have enabled the validation of planning choices in advance of the design of new redevelopment plans, which guarantees their success. It can therefore be assumed that the public will have respect both for facilities and protection measures.

3.2.2. Interest of public perception studies for awareness campaigns

Both user practices (retreat to dunes at high tide) and surveys have emphasized that users have a limited understanding of dune degradation processes despite they consider dunes as valuable assets. They consider coastal erosion as a natural phenomenon and do not realize that their behaviour can contribute significantly to its aggravation. Given this fact and the recent occurrence of the intense storm Xynthia (February 2010), that caused primarily flooding and secondarily shoreline receding, it was decided to design an exhibition highlighting the vulnerability of the beach/dune system and disturbing impacts of human activities.

Another awareness campaign was designed on the question of algae as they became a major concern both for the public and for decision-makers when the deposits that had accumulated on the Atlantic coast during the summer of 2011 proved to pose threat to human health.

Conclusion

From the French example of the Oléron Island Coastal Quality Action Plan, this paper has highlighted the main role that beach perception studies can play to support practitioners in beach quality improvement. At this stage, three key conclusions can be outlined.

The first point is that beach perception studies must be included in beach quality research works as beach perception is a main driver both of beach frequentation and beach user behaviour. As such, it constitutes a field of investigation that must imperatively be addressed for beaches to be properly managed and beach environments protected.

Secondly, beach perception studies demonstrate that users are strongly attached to the natural character of the coast and to its physical assets, which should convince decision-makers and practitioners that environmental preservation has to be a priority and that more facilities are not necessarily needed at beach sites. Landscape quality, water quality and waste management are major concerns for the public that have to be addressed as priorities. Actually, users concerns have not significantly changed since the pioneer studies by R. Morgan and

A.T. Williams that demonstrated in the 1990's the crucial importance that the public assigned to environmental factors.

At last, in the current context, it seems urgent to inform the public about coastal hazards and particularly shoreline receding where it is acute, so as to include infrastructure relocation in beach redevelopment plans. Quality-based policies and risk management policies should be coordinated as they are linked. For example, engineering structures aimed to protect coastal roads and car parks contribute to dune degradation and beach quality loss. So, the removal or realignment of coastal roads and car parks would at the same time reduce coastal risks and improve beach quality. Therefore it should be encouraged, all the more that the results obtained show that the public is not opposed neither to such interventions, nor to the use of public transport to get to the beach.

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