



## Concessions within the maritime-terrestrial public domain on the beaches of southeastern Spain

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### ABSTRACT

Tourism makes an important contribution to the economies of some territories, especially 'sun and sand' tourism that uses public domain areas. Some of these areas are operated through concession systems. This article studies the evolution of 31 eminently touristic beaches in 5 provinces of the Spanish Mediterranean coast during the period 2005–2016, analysing both their physical (shoreline evolution) and administrative (concessions documents) aspects. For this purpose, orthophotos interpreted by Geographic Information Systems are used, as well as the concession contract for each beach. The results obtained show that first, there is no relationship between the evolution of the shoreline and the surface area that is assigned under the concession agreement. Second, concessions do not follow uniform criteria (i.e., set boundaries, surface area, annual fee or distance from the water line). Despite the existence of specific legislation applicable to the entire Spanish coastline, there also exist loopholes in it. The conclusion of the study is that for the sustainable management of these areas, it is necessary to link the physical aspects of beaches with the management of the public domain. This would achieve a balance between the natural, economic and social aspects of the territory, and would ensure that there is no decrease in the quality of the beach, which would have a negative impact on visitor satisfaction. This is crucial to avoid in the tourism sector, which is a key GDP contributor for many countries.

### 1. Introduction

Coastal areas are one of the most popular tourist destinations in the world (Holden, 2000; Sánchez, 2001), particularly Spain's Mediterranean coastline. This is due to its ideal climatic conditions, in addition to the large extension of beaches, that constitute one of the most important attractions of world mass tourism within the "sun and sand tourism model" (Sardá et al., 2014).

Numerous studies show that the coast offers citizens a strategic place for commercial activity and transport, in addition to having a wide range of services and recreational and social alternatives (EEA, 2006). Likewise, the high tourist indicators indexes in coastal towns and cities have promoted socio-economic aspects, especially in coastal infrastructures (Keul, 2015). This kind of infrastructure (hotels, restaurants, etc.), allows the needs of the users, mainly tourists, to be satisfied (Aguiló et al., 2003). Europe is the world's leading tourist destina-

tion, receiving half of the total number of international tourists, with an annual growth of 8% in 2017 (UNWTO, 2018). Tourism contribution to GDP of some countries is very significant, to the extent that it is considered one of the main industries, and, therefore, good management is necessary. In the case of management of natural public assets, the manager must make the best decisions for society by maintaining the functionality of natural systems and avoiding the degradation of goods and services (Sardá et al., 2014). As the demand for the use of public spaces is growing, management becomes more complicated (Dormios et al., 2000), therefore different management systems have been developed based on different criteria: (i) quality (ISO Standards), and (ii) Environmental Management Systems on beaches (EMSBs). These systems facilitate working under the principles of Integrated Coastal Zone Management (Sardá et al., 2012) to obtain a sustainable coastal system that will accommodate the increase in anthropogenic pressure (Barragán, 2005; Sardá et al., 2005).

However, applying ecosystem management principles in practice is still seen by many social agents as confusing due to unclear terminol-

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ogy, which, combined with complex system of institutions with highly fragmented legal remit, gets it even more complicated (Bainbridge et al., 2011; Cormier et al., 2010). In the Spanish case, the administrative and maintenance scheme for beach management is equally complicated due to the overlapping and uncoordinated jurisdictions between national and local administrations (Ariza et al., 2008; Breton et al., 1996). To try to regulate this area, the Coastal Law of 1969 was developed, which introduced the first beach planning measures, and in 1970 the first guidelines with specific regulations for the urban beaches management were published (Ariza, 2007). These guidelines were subsequently embodied in a new Coastal law (Law 22/88 of Coasts 1988) and Regulation 1471/89. This law significantly changed approach to and practice of beach management, establishing new competences for the different Spanish administrations.

Theoretically, responsibilities in coastal management are distributed across three levels of the state administration (Ariza et al., 2008; Coastal law 2/2013): i) the Central Administration, that manages the coastal public domain; ii) the Regional Administration, that manages land-use planning; and iii) the Local Administration, which is responsible for the maintenance and provision of services to users. This distribution of competencies gives rise to great confusion during the decision-making process that is necessary to achieve the proper solutions for the manager (Palazón et al., 2016). Thus, one of the problems is the management of certain uses (which may be private, although in no case represents a change of land ownership) within the maritime-terrestrial public domain (MTPD) (Coastal law 22/1988). The occupation of the MTPD can generate conflicts between the licensee and the beach users, which requires precise management of this sensitive area. Thus, these high activity concentration areas are classified as special interest (Amoedo-Souto, 2009; Torres, 2009).

One of the tasks that beach managers must perform is to pay special attention to the evolution of the shoreline, since there are studies that demonstrate its continuous retreat because of coastal erosion. This regressive process relentlessly generates a smaller beach surface area (Alexandrakis et al., 2015; Pagán et al., 2016, 2017, 2018). EC (2004) states that traditional local management models are not a good way to solve erosion problems, since the spatial scale of many of these problems goes beyond the local level, yet these managers are in charge of their maintenance and operation. Therefore, from the tourism industry point of view, an appropriate ecosystem management must take into account the relationships between society and ecosystems (Jiménez et al., 2007).

According to the present Spanish Coastal Law, any occupation of the state MTPD public property assets with permanent works or facilities, or removable facilities for a period greater than four years, will be subject to a prior concession agreement granted by the State Administration in public bidding. In this case, concession contracts imply for the designed operator to have the exclusive right to operate, maintain and carry out a user-paid service on public property (e.g., a beach) for a given number of years, in exchange for an annual concession fee. These occupations may not be granted for a period exceeding five years, extendable for equal periods of time.

This work analyses the shoreline evolution of 31 beaches (all of them with a strong tourism presence) in 5 Spanish provinces, and their relationship with the management. At the same time, specifications of concessions (surface area, set boundaries, distances from the concession area to the coastline, annual fee) are studied. Finally, it evaluates whether the concession contract specifications are complied with by the concessionaires (concession areas and distances to the coastline), and the existence of a possible relationship between the concession areas and the evolution of the coastline between the 2005–2016 period.

## 2. Study area

The study area comprises 31 beaches on the Mediterranean coast, located in the provinces of Valencia (5), Alicante (7), Murcia (4), Almería (8) and Granada (7), whose coasts have very different physical characteristics (Fig. 1). The area to the north of Cape Nao (Alicante) borders with marshlands intensely transformed by agricultural activity, whereas to the south up to the city of Alicante, the coast is characterized by a landscape of coves and cliffs. Further south, there are extensive beaches and coastal lagoons such as Torrevieja or Guardamar, with some islets off the coast.

On the Murcia coast, the effect of wind on the sand gives rise to an important dune field that has closed the coastal lagoon of the Mar Menor (higher temperature and salinity than the outer sea). The southern part of the province is made up of cliffs with small beaches. In this area and the province of Alicante there are important seabed areas where *Posidonia oceanica* meadows stand out.

In the provinces of Granada and Almería, the foothills of the Betic Mountains near the coast determine very narrow coastal plains, except for the valleys of some rivers. The rivers are short, with markedly seasonal regimes, some with ephemeral currents, but with a significant sediment discharge during the floods.

The tides in the Mediterranean are not constant in time and vary in terms of the type of tide (diurnal, semidiurnal and mixed). They usually have astronomical amplitudes between 0.2 and 0.4 m, so they are considered micro-tides but near the strait area, the amplitude of the tides increases to 0.72 m (Ecolevente, 2006; Ecomag, 2009).

The studied beaches (Table 1) have high occupation (over 90%) and urbanization (over 80%) levels, with sand beaches (70.9%) predominating over gravel beaches (25.8%). In the southern beaches (provinces of Granada and Almería), dark sands predominate, compared to the other provinces with mostly golden sands (Magrama, 2016).

## 3. Methodology

According to Codignotto (1987), for the purpose of this article, “beach” shall mean the area of unconsolidated material extending towards land from the low tide line to where there is a noticeable change in material or in physiographic conditions, or where the vegetation line is permanent. Maritime-terrestrial public domain (MTPD) is defined in Article 3 of the Coastal Law 1988. MTPD comprises the following zones: sea shore and estuaries, including intertidal zones, beaches, coastal dune fields and similar deposits; marshes, lagoons and generally lowlands flooded by tidal flows; territorial and inland waters, including their bedding and subsoil; and natural resources within the economic zone and the continental platform.

To determine the erosion and retreat of the beach shoreline, as well as to determine the concession area used and its position on the beach, orthophotos were used between 2005 and 2016 (most recent available) obtained from PNOA (Plan Nacional de Ortofotografía Aérea) website (<http://pnoa.ign.es/ortofotos>). In order to digitalize the different surfaces, ArcGIS software (software specialized in Geographic Information Systems) was used. For the shoreline digitalization, the criterion followed was the choice of the last wet tide mark on the sand (Casal et al., 2010).

Starting from the polygons generated by the ArcGIS software for each of the studied beaches, and taking into account the beach nourishments carried out (information provided by the Directorate General of Coasts), the following data were obtained: i) Total beach surface area; ii) Concession area or area included within the concession perimeter; and iii) Net beach area or difference from the other two.

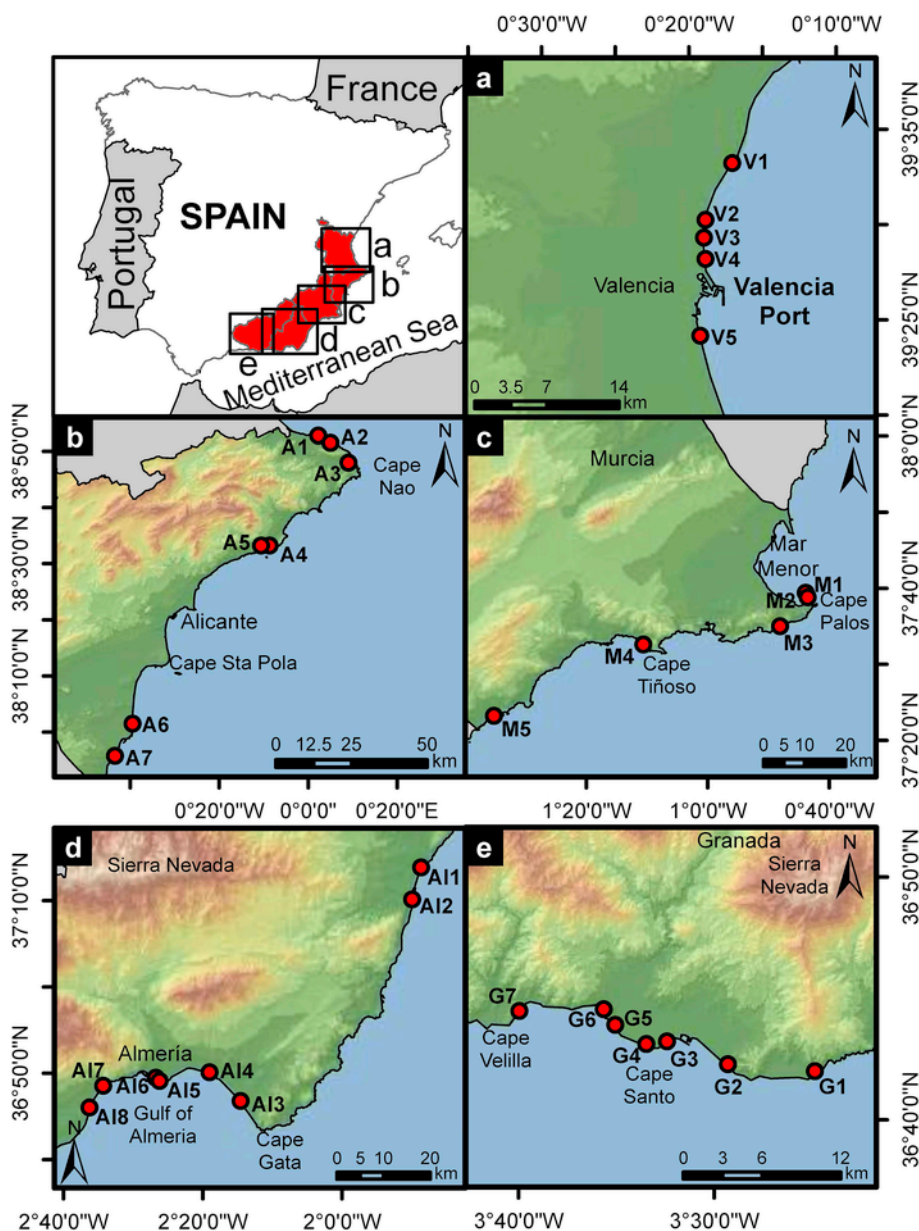


Fig. 1. Location of the study area and the analysed beaches. a) Valencia province. b) Alicante province. c) Murcia province. d) Almería province. e) Granada province.

The data about the physical characteristics of the beaches (sediment typology and length) were obtained from the online beach guide edited by the Ministerio de Agricultura, Pesca, Alimentación y Medio Ambiente (Magrama, 2016).

Finally, the specifications for the administrative concessions were obtained from the web pages of the city councils, where the bids for seasonal services are published. In Table 1, those beaches where administrative documents could not be found nor provided by the respective councils are filled with the “N/A” (data not available) text.

#### 4. Results and discussion

Beaches represent an important attraction for a host of establishments (bars, restaurants, umbrella and hammock rentals, beach bars, water sports rentals, etc.) that, in most cases, require authorization to operate their businesses as a concession, due to the location of these within the MTPD (article 115 Coastal Law 22/1988). As a result, there is an important concentration of activities in the beach environment,

giving rise to large concentrations of users and significant socio-economic repercussions. For this reason, these areas are classified as special interest and relevance to the Spanish coastline (Amoedo-Souto, 2009).

The extent of the shoreline retreat has varied within the study area, ranging from large to small retreats (Table 1; the surface areas obtained in each of the studied years can be seen in supplementary material 1). This process is also evident in almost every beach on the Spanish coast (Aragónés et al., 2015; Chiva et al., 2018; Jiménez et al., 1997). Beaches such as Marineta Cassiana (8762.6m<sup>2</sup>; -42.0%) or Granada (-34,130.2m<sup>2</sup>; -45.9%) have suffered large surface area losses (Table 1), while other beaches have gained surface area, but taking into account the sand nourishments made, the final balance is negative. This is the case of Marchamalo, Calahonda or Zapillo (Table 1). Beach morphology, sediment type, wave energy, tides, etc., are factors that have played a role in the degree of the shoreline retreat (Aragónés et al., 2015, 2016; Marcomini and López, 1997; Pagán et al., 2016).

**Table 1**

Physical characteristics of the beaches studied and the concession contract specifications. Beaches marked with \*have been nourished during the study period, and those marked with "EB" in Period column indicate the concession contract include Easter Break. "N/A" indicates data not available in concession documents.

Code	Beach	Municipality	Province	Occupation level	Urbanization level	Sediment	Length	Concessions		Area (m <sup>2</sup> )	Shape	Annual fee (€/m <sup>2</sup> )	Shore distance	Current area (m <sup>2</sup> )
								Period						
A1	Les Marines	Denia	Alicante	High	Urban	Sand	1900	01/06–30/09		700	N/A	2.71	N/A	41382
A2	Marineta Casiana	Denia	Alicante	High	Semiurban	Sand	400	01/06–30/09		200	N/A	5.25	N/A	12081
A3	El Arenal	Jávea	Alicante	High	Urban	Sand	550	15/05–30/09		3140	Rectangular	5.66	N/A	39090
A4	Levante	Benidorm	Alicante	High	Urban	Sand	2000	15/02–15/01		13800	N/A	1.27	6	11027
A5	Poniente	Benidorm	Alicante	High	Urban	Sand	3200	15/02–15/01		5100	N/A	1.27	6	20221
A6	LaMata	Torreveja	Alicante	High	Semiurban	Sand	2500	N/A		N/A	N/A	N/A	N/A	87865
A7	Cala del Bosque	Orihuela	Alicante	High	Urban	Sand	258	15/03–15/11		800	Rectangular	N/A	6	31610
V1	Pobla de Farnals	Pobla de Farnals	Valencia	High	Urban	Gravel/sand	400	01/06–31/10		32	N/A	1.29	N/A	17175
V2	PortSaplaya	Alboraya	Valencia	High	Urban	Gravel/sand	1400	N/A		N/A	N/A	N/A	N/A	50281
V3	Patacona	Alboraya	Valencia	High	Urban	Sand	1100	N/A		N/A	N/A	N/A	N/A	10755
V4	La Malvarrosa	Valencia	Valencia	High	Urban	Sand	1200	01/05–30/09 + EB		2600	N/A	4.00	N/A	13107
V5	Pinedo	Valencia	Valencia	High	Urban	Gravel/sand	1200	01/05–30/09 + EB		500	N/A	4.00	N/A	24398
M1	Marchamalo*	Cartagena	Murcia	High	Urban	Sand	1600	01/04–31/10		340	N/A	3.85	N/A	69965
M2	Galúa*	Cartagena	Murcia	High	Urban	Sand	2000	01/04–31/10		442	N/A	1.29	N/A	37252
M3	Cala del Barco	Cartagena	Murcia	High	Semiurban	Sand	40	N/A		150	N/A	1.95	N/A	1152.
M4	La Azhoía	Cartagena	Murcia	Medium	Urban	Gravel/sand	1190	01/04–31/10		155	N/A	4.20	N/A	22794
M5	La Colonia*	Aguilas	Murcia	High	Urban	Sand	575	N/A		N/A	N/A	N/A	N/A	87495
A11	Playazo*	Vera	Almería	High	Semiurban	Sand	1200	01/06–15/10		400	N/A	0.22	N/A	14552
A12	Mar. del Torre	Mojácar	Almería	High	Semiurban	Sand	1900	N/A		N/A	N/A	N/A	N/A	73241
A13	C. Gata	Almería	Almería	High	Urban	Sand	2500	01/06–31/10		200	Rectangular	0.93	6	62564
A14	Retamar*	Almería	Almería	High	Urban	Gravel/sand	1250	01/06–31/10		200	Rectangular	0.93	6	53475
A15	Nueva Almería	Almería	Almería	High	Urban	Sand	1500	01/06/31/10		200	Rectangular	0.93	6	27285
A16	Zapillo*	Almería	Almería	High	Urban	Sand	1150	N/A		N/A	N/A	N/A	N/A	72324
A17	La Romanilla*	Roquetas de mar	Almería	High	Urban	Sand	1000	N/A		N/A	N/A	N/A	N/A	94227
A18	Aguadulce*	Roquetas de mar	Almería	High	Urban	Sand	3600	N/A		N/A	N/A	N/A	N/A	92735
G1	Calahonda*	Motril	Granada	High	Urban	Sand	1400	15/06–15/09 + EB		N/A	N/A	N/A	6	81745
G2	Torrenueva	Motril	Granada	High	Urban	Sand	1700	15/06–15/09 + EB		N/A	N/A	N/A	6	91351
G3	PonienteM	Motril	Granada	Medium	Urban	Gravel/sand	2100	15/06–15/09 + EB		75	N/A	1.7	6	32286
G4	Granada	Motril	Granada	High	Urban	Sand	1450	N/A		N/A	N/A	N/A	N/A	40095
G5	LaCharca	Salobreña	Granada	High	Urban	Gravel/sand	1800	N/A		175	Rectangular	4.05	N/A	87624
G6	LaGuardia	Salobreña	Granada	Medium	Semiurban	Gravel/sand	1100	N/A		50	N/A	4.05	N/A	21450
G7	Velilla	Almuñecar	Granada	High	Urban	Gravel/sand	1470	01/06–30/09 and 1/12–31/03		65	N/A	0.25	N/A	83295

Beach occupation, including season services, could not exceed half of its surface at high tide according to Spanish coastal law. Therefore, the concession contracts established for the occupation of part of the beach (MTPD) by hammock and umbrella rental firms must be in accordance with the beach surface area specifications. Otherwise, it can

cause a loss of useful beach surface area (to the beach user) and an increase in people density, possibly to over populating the beach (Fig. 2). However, as shown in Fig. 3a, there is no correlation between concession area and beach area. Perhaps one of the problems is the lack of consensus in research on beach facilities or required safety (Scherer et



Fig. 2. Saturated Levante Beach (Benidorm).

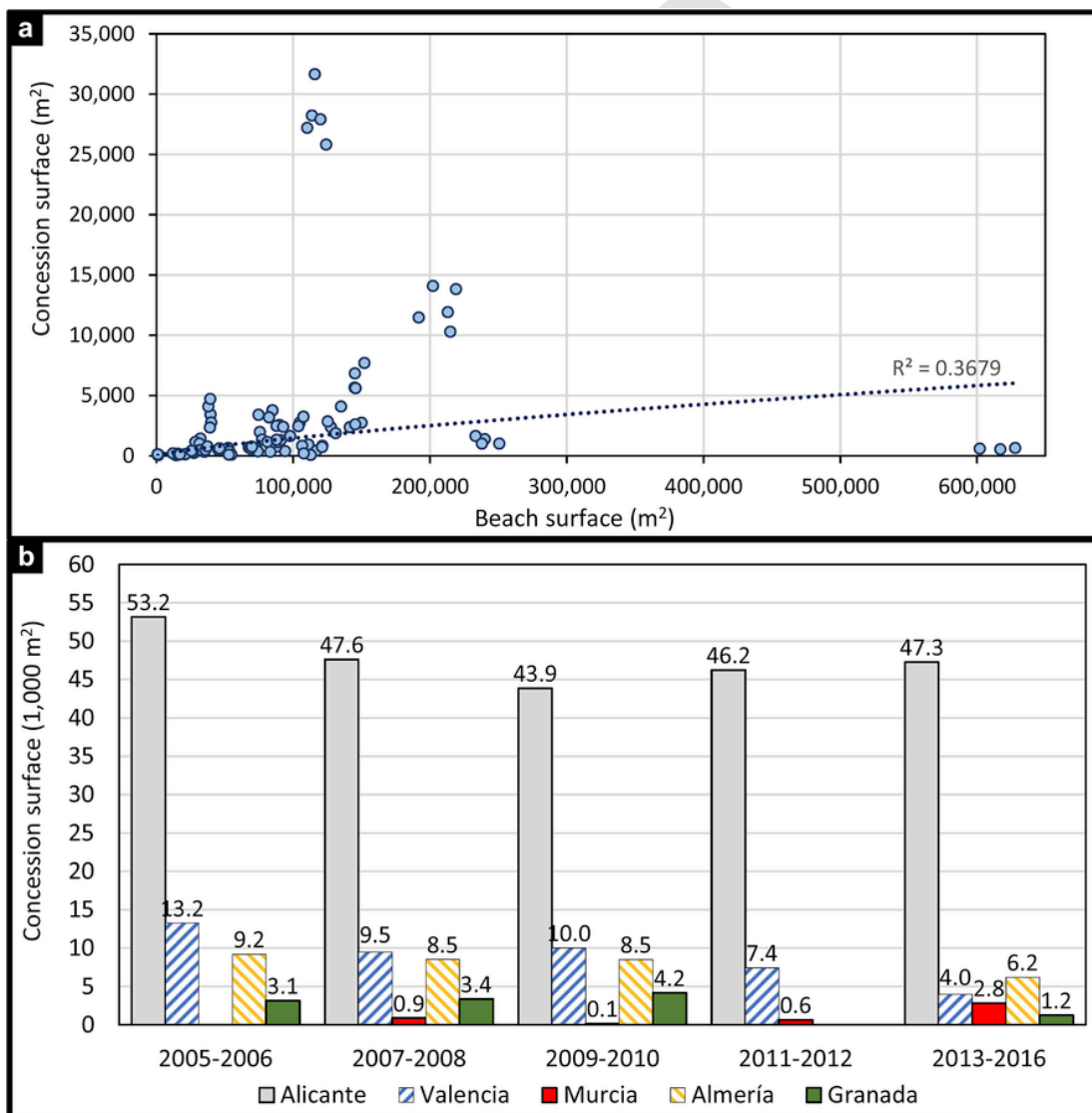


Fig. 3. a) Correlation between the area of beaches and the area of concessions. b) Evolution of the concession area by province.

al., 2014). From the analysis of the evolution of concession surface area (measured) by province (Fig. 3b), it can be seen that both Alicante and Murcia show a variation marked by the downturn in the 2009–2010 period (economic crisis), after which the concession area increases again, but in Valencia, Almería and Granada the concession area tends to decrease. It should also be noted that concession areas are only a small proportion of the beach surface area (Table 1). In Alicante, the area occupied by the concession is less than 6% of the beach, while in the other provinces it does not exceed 2%, although there are always exceptions such as the Levante beach in Benidorm (24.7%) or the Cala del Barco (10.8%). The lack of correlation (Fig. 3a) is directly related to the lack of administrative convergence, because despite the Provincial Head Offices of Coasts (belonging to the General Directorate of Coasts) authorizing the concession specifications, each the concession contract is different, depending on the Beach involved.

Furthermore, the concessionaire does not comply with the surface area, position or geometric shape set out in the concession contract (Fig. 4). It can be clearly seen that the concessionaire's objective is: i) occupy as much space as possible in order to place as many units (umbrellas and/or hammocks) as possible and maximise profit. Increases in the real occupied surface area can be generally observed (Table 2), ranging from 1.9% in the Poniente (Benidorm, Alicante) or 3.7% of the Poble de Farnals (Valencia) to 86.5% in Galúa (Murcia) or el 104.3% en Marchamalo (Murcia). Although there are also decreases that can reach 82.2% of Patacona or 75.7% of the Malvarrosa (both in Valencia). ii) Improve comfort for customers, as seen in Levante beach where the concessionaire is located around the beach accesses (Fig. 4a). This situation is detrimental to the other beach users by altering the beach carrying capacity (Jiménez et al., 2007), which has negative effects due to the current mode of coastal management (Sánchez, 2001).

From the analysis of the specifications, only the Benidorm concession contract refers to a possible decrease in the area originally

awarded due to the shoreline retreat (Supplementary material 2). The other administrative documents analysed do not refer to this problem, although it is pointed out that the Spanish Administration could reduce the concession area without explicitly mentioning the shoreline retreat. Not taking into account the variation of the beach surface area when determining the concession surface area may cause changes in carrying capacity. Therefore, for beaches whose most important economic activity is tourism (as in the case of Benidorm), carrying capacity (despite being a dynamic value) should be a basic indicator of integrated coastal zone management (Botero and Diaz, 2009; Jiménez et al., 2007; Valdemoro García, 2005).

The distance between the concession and the shoreline was also analysed, noting that not all concessions regulate it and in those that are regulated the distance is 6 m, complying with this distance in most cases (Fig. 4). However, no mention was found in the coastal legislation or regulations relating to this distance. Although, as the tidal range in the analysed area is less than 0.72 m (Puertos del Estado; www.puertos.es), this parameter does not have a significant influence in terms of reducing the 6 m walking area for beach users.

Another aspect to consider is the distance between the beach users and the shoreline. The study shows that in most of the beaches, users are located less than 40 m from the shoreline (Fig. 5). This is consistent with da Silva's (2002) and Jurado (2015) studies, where most beach users are located less than 50 m from the sea. This could be related to the sand temperature and the distance from the swimmer to the water.

The study of the annual fees of the concession areas ( $\text{€}/\text{m}^2$ ) obtained from the different concession contracts, shows that there is a significant variation in prices between the different concessions (Table 1). However, these differences are not related, as might be thought, to existing demand. Thus, it is observed that mainly tourist beaches, such as Benidorm or La Malvarrosa (Valencia) have very different values, 1.27  $\text{€}/\text{m}^2$  compared to 4  $\text{€}/\text{m}^2$ , respectively. When analysing the aver-

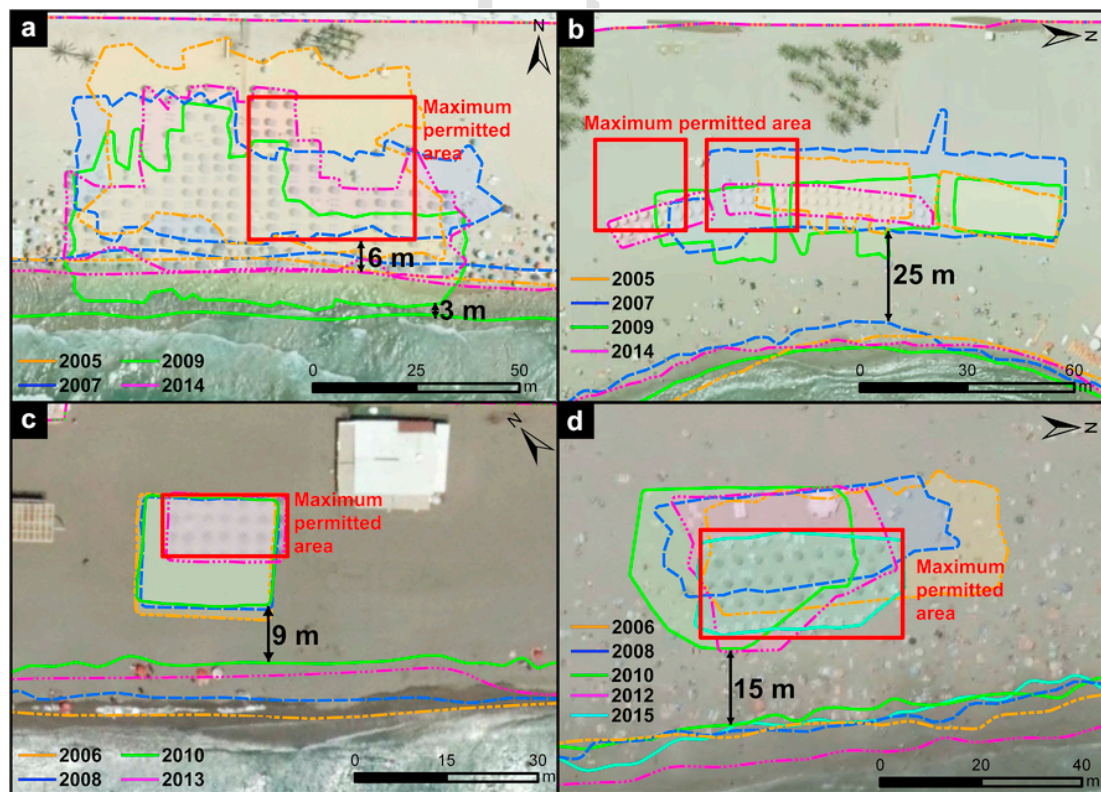


Fig. 4. Evolution of the shorelines and concessions, and maximum area allowed for the concession. a) Levante (Alicante). b) Arenal (Alicante). c) Nueva Almería (Almería). d) Malvarrosa (Valencia).

**Table 2**  
Relationship between official concession data and those measured on each beach.

Beach	Municipality	Province	Period	Measured concession area (m <sup>2</sup> )			Official concession		Average difference	
				Initial	Final	Variation	Data	Surface area (m <sup>2</sup> )	m <sup>2</sup>	%
Les Marines	Denia	Alicante					YES	700.0		
Levante	Benidorm	Alicante	2005/2014	31639.8	27203.3	-14.0%	YES	13800.0	15621.6	113.2%
Poniente	Benidorm	Alicante	2005/2014	13808.4	14068.6	1.9%	YES	5100.0	8838.5	173.3%
El Arenal	Jávea	Alicante	2005/2014	3421.5	2338.6	-31.6%	YES	3140.0	-260.0	-8.3%
Marineta Casiana	Denia	Alicante	2005/2014	115.8	196.7	69.8%	YES	200.0	-43.8	-21.9%
La Mata	Torre Vieja	Alicante	2005/2014	2742.5	2468.5	-10.0%	NO			
Cala del Bosque	Orihuela	Alicante	2005/2014	1424.8	999.7	-29.8%	YES	800.0	412.3	51.5%
Pinedo	Valencia	Valencia	2006/2012	1369.7	999.6	-27.0%	YES	260.0		924.61
Pobla de Farnals	Pobla de Farnals	Valencia	2006/2015	105.8	109.7	3.7%	YES	110.0	-2.3	-2.1%
Patacona	Alboraya	Valencia	2006/2012	4082.8	727.0	-82.2%	NO	1125.0		1279.91
Port Saplaya	Alboraya	Valencia					NO	1069.0		
La Malvarrosa	Valencia	Valencia	2006/2015	7685.3	1866.3	-75.7%	YES	1400.0	3375.8	155.9%
Marchamalo	Cartagena	Murcia	2007/2016	360.9	737.4	104.3%	YES	737.0	-187.9	-25.5%
Cala del Barco	Cartagena	Murcia	2007/2016	88.0	124.1	41.1%	YES	124.0	-17.9	-14.5%
Galúa	Cartagena	Murcia	2007/2016	418.0	779.6	86.5%	YES	780.0	-181.2	-23.2%
La Azhoía	Cartagena	Murcia					YES	155.0		
Zapillo	Almería	Almería					NO			
Nueva Almería	Almería	Almería	2006/2013	442.2	211.3	-52.2%	YES	211.0	115.8	54.9%
C. Gata	Almería	Almería	2005/2010	646.9	578.2	-10.6%	YES	200.0		412.53
Mar. del Torre	Mojácar	Almería	2006/2013	1986.4	581.3	-70.7%	NO	581.0	702.9	121.0%
Retamar	Almería	Almería	2005/2010	490.8	503.9	2.7%	YES	200.0		297.31
La Romanilla	Roquetas de Mar	Almería					NO			
Aguadulce	Roquetas de Mar	Almería	2006/2013	3753.6	2392.7	-36.3%	NO	2393.0	680.2	28.4%
Playazo	Vera	Almería	2006/2013	2364.0	2618.1	10.7%	YES	2618.0	-126.9	-4.8%
Granada	Motril	Granada	2005/2010	352.3	644.2	82.9%	NO			
Velilla	Almuñecar	Granada	2006/2013	1112.0	323.7	-70.9%	YES	324.0	393.9	121.6%
Calahonda	Motril	Granada					NO			
Poniente	Motril	Granada					YES	75.0		
Torrenueva	Motril	Granada	2005/2010	432.4	194.8	-54.9%	NO			
La Guardia	Salobreña	Granada	2006/2013	321.0	149.6	-53.4%	YES	150.0	85.3	56.8%
La Charca	Salobreña	Granada	2006/2013	929.3	756.6	-18.6%	YES	175.0	86.0	11.4%

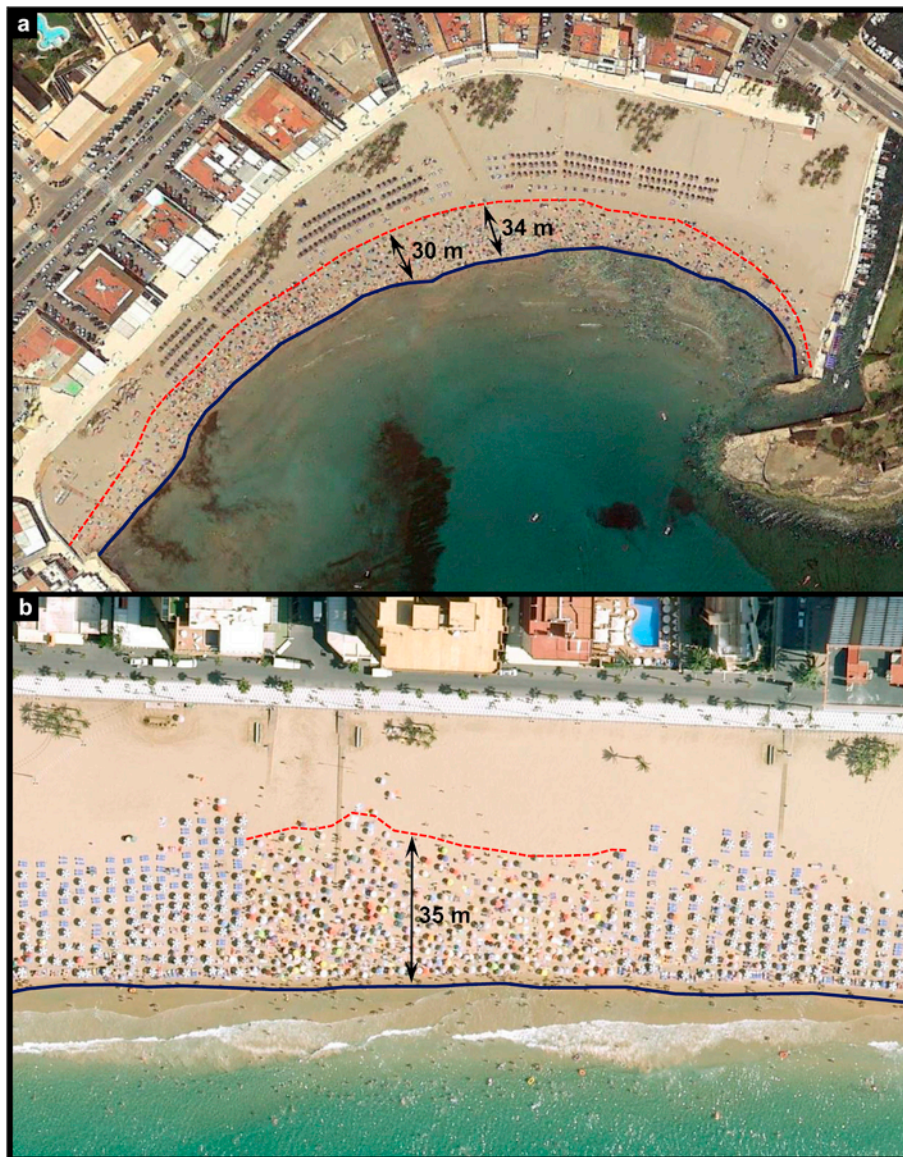


Fig. 5. Location of beach users from the shoreline. a) Arenal (Alicante). b) Levante (Alicante).

age annual fees per concession by provinces, Almería is the cheapest with an average of 0.84 €/m<sup>2</sup> and Alicante and Murcia the most expensive with around 3 €/m<sup>2</sup>. Concerning the concession period, all concessions generally run from June to October, including the Easter period on some beaches. However, Benidorm is an exception, with a concession period of 11 months.

Therefore, even though some researchers argue that the beach is an ecosystem at risk and unable to absorb a greater anthropogenic impact (Aragonés et al., 2015; Pagán et al., 2017), others underline the importance of tourism development for the economy of a territory because it is a reference sector worldwide (Craig, 2016; Sardá et al., 2014). For Spain, tourism is a highly important social and economic activity; therefore, reconciling the functionality of these spaces with the problems associated with the conservation and stability of the seaside is a key priority. This is especially important for Spain's Mediterranean beaches, as they are frequented on a massive scale. The management of the MTPD should be compatible with the evolution of the coastline in a way that maintains ecosystem management criteria and does not contribute to beach degradation or saturation. The concession contract

specifications should also clearly indicate the area, geometry, distance from the coastline, and additionally the retreat of the coastline as a decisive factor in reducing the concession area.

## 5. Conclusion

The study carried out shows that the concession areas have no relation to the beach surface area or to the evolution of the coastline. In addition, concessionaires generally do not comply with either the area or the set boundaries detailed in the concession contract specifications, although the minimum distance to the shoreline (6 m) is met. All this can damage the satisfaction of users by reducing the zone of free movement in the beach area, which can lead tourists to choose other destinations.

The lack of uniformity in the criteria specified for the different concession contracts is partly due to legislative loopholes in coastal management. Although it is the Spanish Directorate-General for Coasts that must authorise the specifications, they should be initiated at local level by using common criteria nationwide (surface area, set boundaries, distance to the coast, etc.). However, the overlapping and uncoordinated



jurisdictions between national and local administrations makes it difficult for this to happen.

The information and communication technologies era provides the possibility of creating tools that give both the beach manager and the beach user information that leads to a more efficient management of resources and enables the coexistence of both elements (tourism and the beach). The issue is not to ban attractive leisure activities on the coast but to make sure that they are carried out in a manner that is sustainable and environmentally friendly.

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### Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ocecoaman.2018.05.011>.

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