



Interjurisdictional coastal management in metropolitan areas



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1. Introduction

Coastal management has become a relevant issue in the national and international political agenda as a consequence of three worldwide tendencies of the contemporary society: 1) an increment of the human population and a simultaneous migration from the rural hinterland to the coastal cities; 2) an increasing number of economic activities and land uses in the coastal zone; 3) more extended and urgent environmental impacts, use conflicts, social risks and economic losses resulting from the previous trends. The coastal urban agglomerations are worldwide proliferating in both number and size. Two-thirds of the cities with a population exceeding 5 million are located at least partially within 0–10 m above sea level (McGranahan et al., 2007). According to the last revisions, among the 28 so-called megacities –that is, urban agglomerations with 10 million inhabitants or more (UN, 2015)–, 13 lie on estuarine or ocean lowlands, and 3 more are within the first 100 km and 50 m elevation from the coast (Blackburn and Marques, 2013).

Coastal megacities represent an unbelievable market of economic opportunities as well as an unprecedented source of challenging socio-environmental issues. The demand for coastal lands is the result of concurrent factors, such as the availability of water and other renewable resources for urban and industrial uses, the cultural value of the shore views in the land market, and the public condition that the juridical systems concede to the littoral fringe.

The boosting pressure of the urban uses and the economic activities result in local/regional and global impacts on the environmental services provided to society by the coastal processes (Costanza et al., 2014). The influence of the coastal urban agglomerations ranges from hundreds to thousands of kilometers into the atmosphere causing heat island effects, topographic flows, sea breezes, air pollution and global warming. It also spreads from tens to hundreds of kilometers into the ocean producing water contamination, fisheries damage, harmful algal blooms induction, etc. (Glasow et al., 2013). In fact, megacities in coastal floodplains are hotspots where many of the symptoms of eutrophication, urbanization, pollution and other syndromes result from synergetic multi-stressors, many of them related to global change (Newton et al., 2012).

Because of these features, the planning and management of coastal megacities is an intricate socio-economic process that deserves special attention (Li, 2003). The Integrated Coastal Zone Management (ICZM) is a comprehensive model developed in the 1970s; it gained the international political scene during the Nations Conference on Environment & Development at Rio de Janeiro in 1992. As enunciated in Chapter 17 of Agenda 21 and the related profuse literature, the ICZM postulates the coordination and integration of scientific knowledge, economic sectorial interests and administrative institutions of all jurisdictional levels.

The theoretical support proposes that significant advantages will derive from adopting the ICZM, an approach that can be difficult to implement in complex systems like the metropolitan areas. The diversity of metropolitan-government arrangements is wide and the analysis of their relationship with the coastal management models deserves special attention because of the prevalence of the coastal megacities and their impacts on the local, regional and global scales. The spectrum of situations varies from strong political and/or administrative centralism (for example, Ibrahim and Shaw, 2012; Kong et al., 2015) to a cluster of autonomous counties. Most metropolitan systems are politically fragmented and, unlike the autonomy that characterizes the city proper, need at least a certain level of integration in order to improve their performance and efficiency. The globalization (increased competition at a global scale and the presence of powerful non-public actors) and the economic change (leading to intensified pressures on municipalities) contribute to institutional

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fragmentation, while the urban sprawl produces fragmentation of the functional space and progressive mismatch between the services networks and the political-administrative jurisdictions (Lackowska, 2011). Legislation places environmental and land uses regulations primarily on local governments. Multilevel coordination comprising local, city region, city and wider scale (Pelling and Blackburn, 2013) is required to manage the transboundary resources and impacts, but competence among economic activities and regional interests discourage collaborative programs. Building metropolitan governance arrangements requires dealing with different visions, divergent technical and political positions, legal restrictions on the formulation and implementation of interjurisdictional plans and programs, asymmetrical fiscal systems, notable differences between rich and poor municipalities and politically fragmented institutions (UN-Habitat, 2008). Therefore, adjacent jurisdictions might show irreconcilable differences and will try to strengthen them. The balance between differentiation and cooperation requires political decision, adequate governance level and fit-to-purpose management instruments –conditions that barely co-occur –and what is undeniable in the theory becomes frequently uncertain in practice.

A thorough literature dealt with the theoretical aspects, framework and methodology of the ICZM and substantial information emerged from the analysis of unitary cities as case studies. To the best of our knowledge, this is the first report on interjurisdictional, non-centralized coastal management in metropolitan areas. The analysis of a metropolitan urban system as a whole is expected to widen the scope of the problems associated with the management of transjurisdictional coastal resources and environmental impacts. This paper deals with metropolitan governance, in particular, the different ways of understanding coastal management as influenced by viewpoints fed through political agendas in administratively fragmented systems. The case of study is the Buenos Aires megacity (Argentina), one of the so-called 'early-

urbanizer' societies in Latin America (Pírez, 2012), which is among the ten most populated coastal agglomerations of the world (Blackburn and Marques, 2013). This case is particularly appropriate to any discussion of management strategies as an example of global(izing) megacities affected by the implementation of major policies reforms resulting in a massive increase in intra-urban, socio-spatial inequalities (Botton and Gouvello, 2008). In Sections 2 and 3, we summarize the geographic characteristics of the study case and the methodology, respectively. In Section 4.1, we examine the population patterns, land use distribution, urban projects, use conflicts and environmental impacts in order to identify the critical, high priority issues. Then, we analyze the management competences and capacities (Section 4.2) and the planning processes (Section 4.3). The discussion regarding the land use changes observed during the postindustrial period (1970–2015) is presented in Section 5.1 in order to identify the Gordian knots that condition the authorities' courses of action. The final Section 5.2 draws attention to major neglected issues of the present management model in order to suggest possible future guidelines.

2. The study area

2.1. Geographic features and political organization

The study area is the coastal fringe of the megacity known as Great Buenos Aires (GBA), a conurbation that extends over 3833 km² with a total population of 12.8 million inhabitants - a third of the country's population (INDEC, 2012). This coastal fringe occupies 1593 km² and it has 5.2 million inhabitants (Fig. 1).

The country is organized as a constitutional federal democratic republic and, consequently, ten different jurisdictions in three levels are superimposed in the study area. From the highest level, those are the national (equivalent to federal) government, the Buenos Aires Province (BAP) (state), seven subrogated

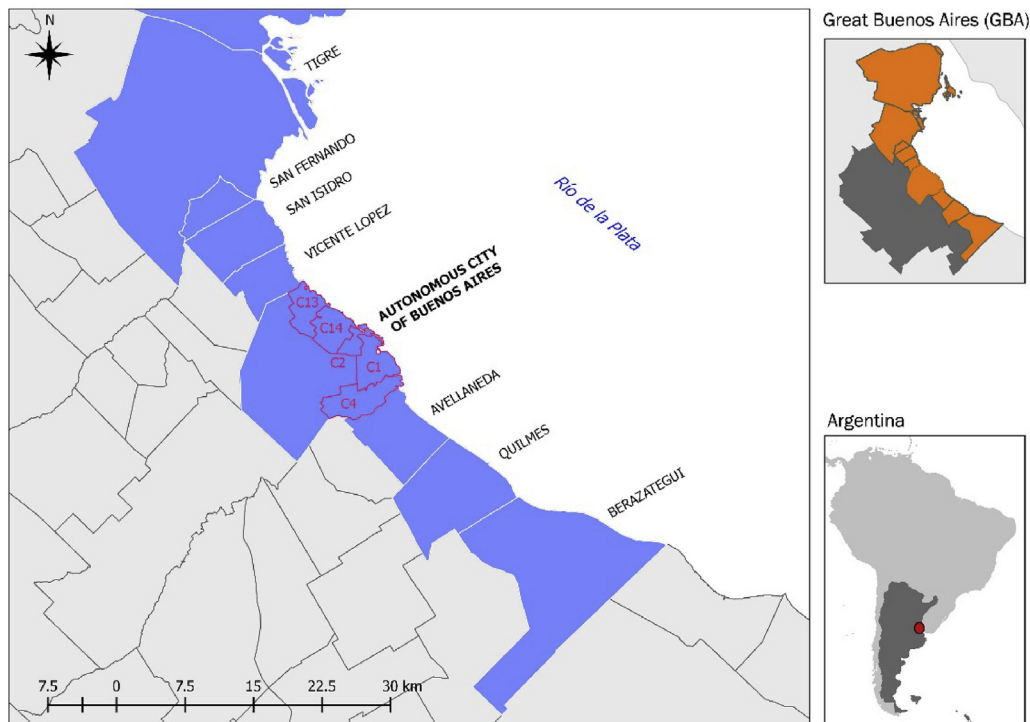


Fig. 1. The Great Buenos Aires (upper right) and the metropolitan coastal system (left). The Autonomous City of Buenos Aires (ACBA) is the capital city of Argentina. C1, C2, C4, C13, C14 are ACBA communes. The other seven municipalities are dependent of the Buenos Aires Province.

municipalities (Tigre, San Fernando, San Isidro, Vicente López, Avellaneda, Quilmes and Berazategui) and the capital; previously dependent of the national government, the capital acquired the status of Autonomous City of Buenos Aires (ACBA) in 1994. There is neither permanent nor operational coordination among all the jurisdictions nor a metropolitan authority.

2.2. Environmental support

The Río de la Plata, located at 35°S, drains a hydrographical basin of approximately 3,200,000 km² (20% of South America) (Acha et al., 2008). It covers five countries (Argentina, Brazil, Bolivia, Paraguay and Uruguay) and it is the second largest one on the continent. It is 327 km long and its mouth is 227 km wide. Its coastal zone includes two physiographic units: the lower terrace (coastal floodplain), bordering the river under the 5-m contour; and the high terrace (Pampean plateau) 5 m above sea level. The high terrace shows a well-defined, irregular border with sloppy bluffs that reach more than 10 m high over the low terrace, interrupted by the discharge of several streams. The low terrace is extended and plain; the width is variable (6–8 km) and the slope is very flat (0.06–0.1) (Pousa et al., 2013). Three river basins (Luján, Reconquista and Matanza-Riachuelo) and numerous stream networks (Maldonado, Medrano, Vega and other minor watercourses) go through the study area and flow into the Río de la Plata. Due to the flatness of the terrain, the low permeability of the substrate and a shallow water table, wetlands occupy more than 50% of the coastal plain (Pousa et al., 2013).

The climate is temperate, classified as a humid subtropical with four distinct seasons. The mean annual temperature is 16.5 °C (Pousa et al., 2013) and the average rainfall for the 1889–2009 period was 896 mm/year, with extreme values of 1622 and 373 mm/year (Carol and Kruse, 2012). Tides are mixed, predominantly semidiurnal. The average tidal range is 0.60 m and the maximum astronomic tide amplitude is 1.11 m. Northwesterly storms affect navigation and drinking water supplies. SE-SSE winds ('sudestadas') can occasionally reach the force of strong gale (75–88 km/h) and elevate the water level up to 4.4 m, interrupting the tributaries drainage and causing severe periodic flooding events forcing coastal inhabitants to be evacuated (D'Onofrio et al., 2008; Pousa et al., 2013).

The hinterland is one of the five extensive loessic fertile soils in the world, the undulated plain of the Rolling Pampas. Yet the tropical forests reach the Río de la Plata through the corridor of the tributary Paraná River and so, unexpectedly rich riparian forests of Amazonian lineage are found in a climate tempered by the wide fluvial water masses (Morello et al., 2000).

2.3. Historic development

The foundation of Buenos Aires in 1580 established from the beginning a spatial distribution of uses and activities taking advantage of the topographic and geomorphologic conditions of the Río de la Plata coast. The historical center was located besides the port of Buenos Aires. The farmlands were bound along the riverside. The slaughters, the facilities for slaves' quarantine, and other scorn activities like meat-curing or leather tanning were placed in the southern low river terrace. This land use distribution was maintained during the colonial period up to the end of the nineteenth century, when the country entered the world economy as commodities producer.

The intricate process of the GBA megacity conformation comprised planned infrastructure expansion, urban sprawl, suburbanization and conurbation. The population of the capital boomed from 660 thousand to 2.4 million inhabitants by overseas

immigration during the economic period of agriculture development and commodities exportation (1870–1930), the periphery expanding radially from the historic center as concentric rings.

At the beginning of the industrialization period (1930–1970), the population of the capital stabilized at around three million inhabitants. The surrounding municipalities (Vicente López, San Isidro and Avellaneda; Fig. 1) reached a plateau at the end of this economic period, conforming a consolidated urban core. The historic development, the urban expansion and the allocation of economic activities defined three different stretches: the Northern Metropolitan Coast (NMC), the ACBA Coast and the Southern Metropolitan Coast (SMC). The industrial development concentrated in the SMC; the NMC maintained a traditional, low density, residential profile. During this period, the low terrace was massively occupied all along the metropolitan coastline except in Berazategui.

3. Methods

We analyzed the population growth, the land use changes, the economic activities, the urban waterfronts, the natural landscape protection, the coastal aesthetics, the public involvement in coastal planning, the legislation and the interjurisdictional arrangements of the three levels of government (national, provincial and municipal) during the 1970–2015 period. We used the Unsatisfied Basic Needs (UBN) index as life quality indicator (INDEC, 2012). This index is a combination of five habitat and social indicators: house type, indoor sanitation type, home crowding level, school attendance and subsistence capacity. The UBN and population data of National Censuses of 1875, 1887, 1895, 1904, 1914, 1936, 1947, 1960, 1970, 1980, 1991, 2001 and 2010 were provided by the National Institute of Statistics and Census. The land uses were classified into the following categories:

- a residential: purely low density residential areas, with or without complementary commercial activity;
 - a.1 informal settlement: slums of irregular ownership, informal urbanization or under restoration;
 - a.2 gated communities, country clubs, nautical clubs: residential areas with restricted access, low density and extended land occupancy;
- b residential/industrial: urban areas combining residential uses of medium to low density with industrial activities such as workshops, warehouses and small factories;
- c mixed uses: medium and high density residential areas combined with services and commercial activities;
- d industrial: big factories, stock houses, warehouses dedicated to industrial and/or petrochemical activities;
- e port areas: cargo and passenger port installations;
- f infrastructure services: areas dedicated to urban services such as sewage and drinking water plants, electric power stations, etc.;
- g road infrastructure: areas dedicated to traffic circulation;
- h sanitary landfill: location areas with sanitary landfills for the disposal of solid urban and industrial residues (not operating at present);
- i illegal waste disposal of different types of residues;
- j specific use: urban activities or services and with a characteristic infrastructure such as prisons, prefecture, periurban storehouses, educational areas, etc.;
- k without specific use: public or private areas vacant for future uses, like wasteland, coastal reclamation grounds, etc.;
- l leisure/recreation: public parks, sport clubs and coastal equipment areas;

- m quarry: areas dedicated to former stone and soil extraction and nowadays transformed in remnant water bodies;
- n rural/natural use: agricultural activities or relicts of natural or semi natural areas in flood plains;
- o preservation of native coastal ecosystems and their associated species.

The land uses, the urban equipment, the scenic aesthetics and the accessibility were studied only in the river low terrace delimited by the 5 m contour and the RN 1 Buenos Aires – La Plata highway (Fig. 4). The information from satellite images (1:20000) and zonation charts of the municipal urban codes was checked and complemented with analysis of photographs and field observation.

4. Results

4.1. What are the critical, high priority issues in coastal zone management?

4.1.1. Population distribution and growth

The GBA relative growth rate during the postindustrial period

(1970–2010) was inversely proportional to the population density and to its distance to the historical center (Fig. 2). The increment peaked in the megacity periphery (San Fernando, Tigre, Quilmes and Berazategui). Within the consolidated central area, population increments were registered only in the slums located on the marginal wetlands and the old landfills. The slums population grew faster than the rest, compensating the stabilization (and aging) of the rest of the population.

The corridor from San Isidro to the ACBA Commune 2 neighborhoods showed the best indicators values (Table 1). The maximum percentage of prosperous population of the entire country lived in this narrow belt, where the highest concentration of governmental, administrative, financial and educational centers was found. The most vulnerable social conditions were registered in the ACBA downtown (Communes 1 and 4), in association with precarious settlements.

Similar outcomes were obtained by using other multidimensional quality indices. For example, a combination of twenty-three social, economic and environmental variables showed that the NMC and ACBA ranked at the top of the entire GBA, due to the distinctive involvement of the ‘most natural’ attraction of the GBA, the Rio de la Plata coast (Celemín and Velazquez, 2012).

4.1.2. Land uses

The land uses showed a disarticulated and even segregated distribution, with sharp differences among the three sectors (Table 2). Ports, real estate and tourism activities were favored to the detriment of others like industrial, fishing and environmental conservation.

The Buenos Aires Port was a central node that articulated the ACBA coast. Since its foundation, the port has been the *raison d'être* of the capital city. It was the most important cargo port within the most complex transport node of the country, operating and interconnected with the hinterland by a transportation node combining the national road, railroads and aerial networks (Table 2, Fig. 3). The port activities were the only coast-dependent productive ones and its growth showed some limitations in the long term (Garay, 2007). Canoeing, rowing, surfing, sailing, yachting and boating (Table 2) have been traditional sports in waterways of the Río de la Plata since the first Yacht Club was founded in 1882 (Vilar Castex, 2002).

During the first decades of the twentieth century, the industries were located in the south of the ACBA. Having no regulation over land uses, the industrial and the residential usually intermixed. The industrial uses extended northward during the thirties and, later on, the sixties (Clichevsky, 2002). Within the studied period, the metropolis as a whole lost industrial activities. The urban dynamics displaced the productive structure parallel to the

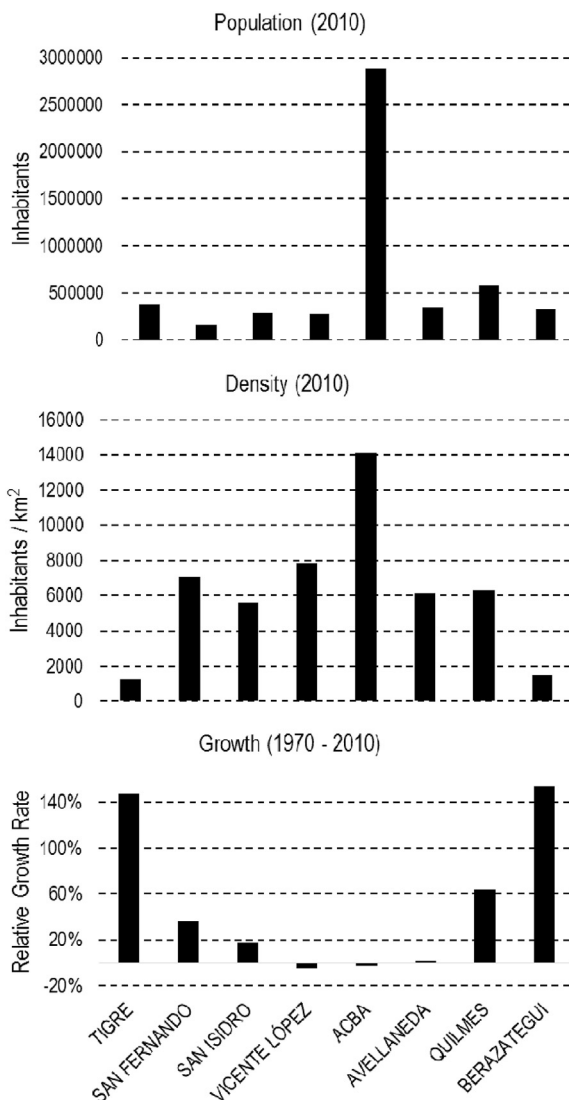


Fig. 2. Demographic indicators of the metropolitan coastal fringe of the Great Buenos Aires. Source: INDEC (2012).

Table 1

Percentage of population with Unsatisfied Basic Needs (UBN index) in the Great Buenos Aires coastal zone (2010). Source: INDEC (2012).

JURISDICTION	UBN (%)
Tigre	11.0
San Fernando	8.6
San Isidro	3.7
Vicente López	2.4
ACBA - Commune 13	1.9
ACBA - Commune 14	2.4
ACBA - Commune 2	2.0
ACBA - Commune 1	15.9
ACBA - Commune 4	12.7
Avellaneda	5.8
Quilmes	9.2
Berazategui	10.4

Table 2

Number of transportation networks, nautical clubs, leisure, recreation, landscape and environmental conservation land uses in the Great Buenos Aires coastal zone. ACBA: Autonomous City of Buenos Aires; NMC: Northern Metropolitan Coast; SMC: Southern Metropolitan Coast. Source: present work data.

	NMC	ACBA Coast	SMC
Transportation networks			
Passenger port terminals	1	2	
Cargo ports		1	1
Railway terminals		3	
Long distance omnibus terminals		1	
Airports		1	
Airfields/Airclubs	1		1
Nautical Sports			
Nautical ports	3		1
Nautical clubs and nurseries	53	4	1
Leisure and recreation			
Private clubs, campgrounds, sports fields	39	18	16
Public coastal walks	15	5	5
Parks and plazas	12	17	1
Landscape and environmental conservation			
Natural/ecological reserves	1	2	3
Biosphere reserves			1
Municipal natural parks	1		
Protected landscape areas	1		

deindustrialization and the increment of the tertiary sectors of the economy in the metropolis. The only remaining industrial pole on the lower terrace of the river was in Avellaneda (Fig. 3).

Industrial and port activities, sewage disposal and sanitation (Table 3) reinforced a view of the SMC as a marginal zone with the highest concentration of degraded areas, and the occupation has been much slower. Rural areas together with natural relicts and

public boulevards persisted in different degrees of decay.

On the contrary, the NMC, originally populated by farms, villas and cottages, consolidated as a strong matrix of low-density residential uses (Table 4, Fig. 4). The differences between the SMC and the NMC regarding the environmental quality, the provision of services and the infrastructure tend to deepen (Pírez, 2004: 75–76). While the southern municipalities put priority on short-term job generation in order to overcome the population poverty, the NMC and ACBA governments invested in private infrastructure developments (Burijson, 2004, p. 92).

Slums and gated communities were coeval in the GBA. The first gated community was founded in the metropolitan hinterland during 1930 (Romero, 1976), the same year that the first slum was set up near the New Port (Vidal-Koppmann, 2007). The restrictions established in the 1970s for residential uses reduced the access of the low-income sectors to the land property and redirected the demand to the higher income sectors. The immediate consequence was a double process of residential expansion in the GBA. On the one hand, the booming of gated communities, nautical clubs and towers manifestly gave market value to the coastal landscape, a scarce resource in a megacity where the rivers and streams flow underground (Section 4.1.3); this scarcity was one of the causes for aquatic landscapes demand (Faggi et al., 2013). The gated communities increased their numbers during the 1990s following the global trends. Roitman and Giglio (2010) estimated that by 2000 there were more than 350 communities comprising 13,000 houses, 78,000 lots in the real estate market, 50,000 residents and investments of 4480 million dollars. The most ambitious was Nordelta (Tigre), a private investment of twenty-four neighborhoods and a programmed population of 40,000 inhabitants (Michelini and Pintos, 2016), supported by *ad hoc* provincial and municipal legislation for this megaproject as a new urban nucleus (Provincial

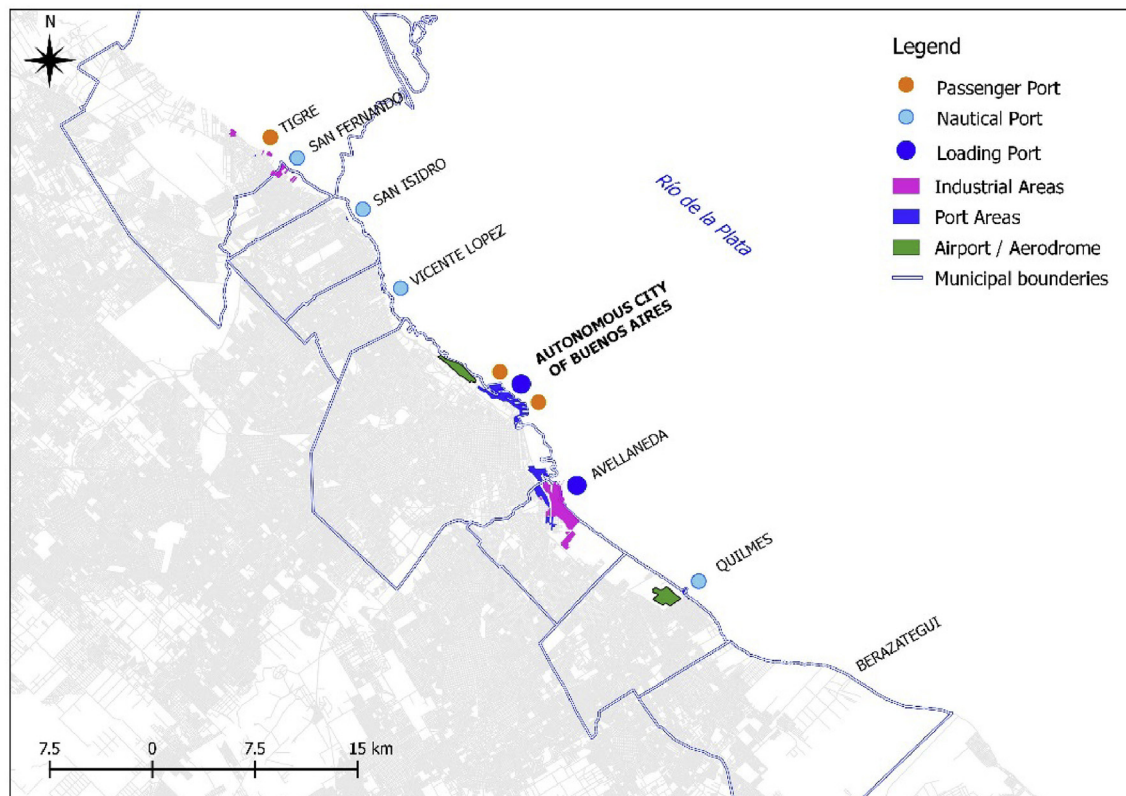


Fig. 3. Ports, airports and industrial areas of the Great Buenos Aires metropolitan coast. Source: present work data.

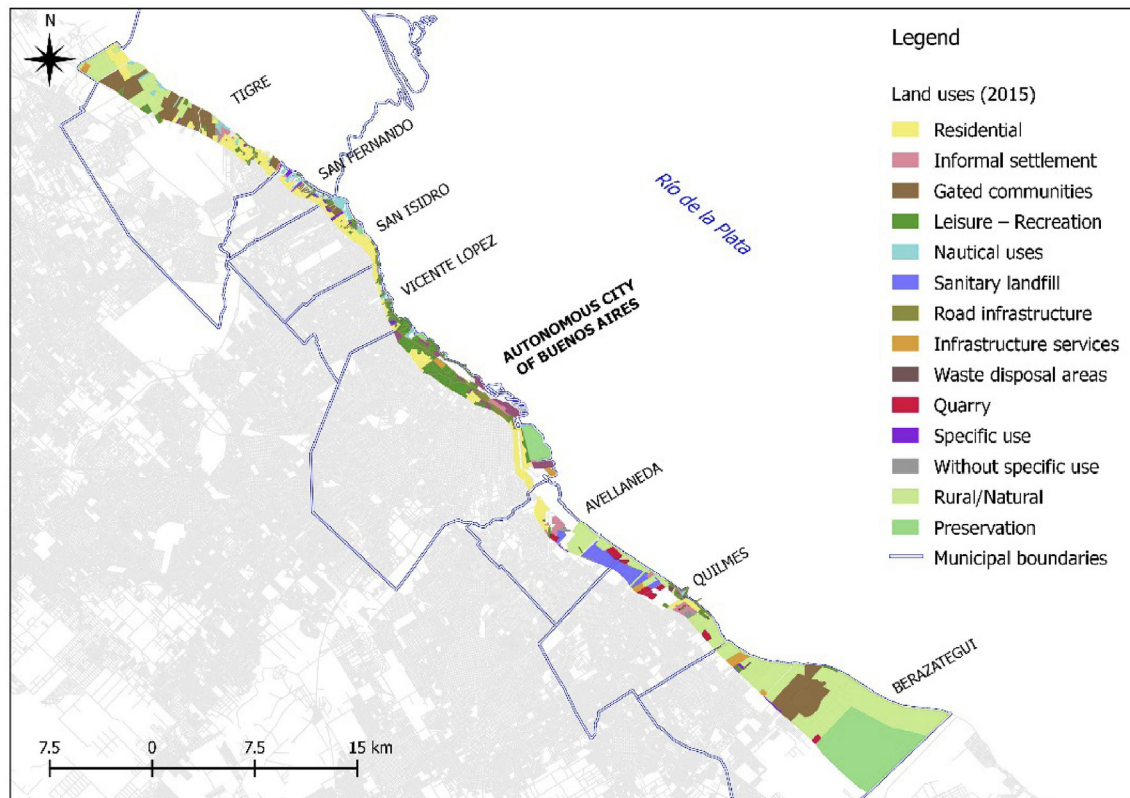


Fig. 4. Land uses (2015) of the coastal low terrace of Great Buenos Aires. Source: present work data.

Table 3

Number of infrastructure, sanitation services and specific land uses in the Great Buenos Aires coastal zone. ACBA: Autonomous City of Buenos Aires; NMC: Northern Metropolitan Coast; SMC: Southern Metropolitan Coast. Source: present work data.

	NMC	ACBA Coast	SMC
Infrastructure and sanitation services			
Water treatment plants	1	1	1
Sewage treatment plants	1		1
Electrical infrastructure		1	2
Landfill areas			4
Specific uses			
Educational areas (campuses)	10	4	
Commercial or services infrastructure (tax warehouses, machinery depots, fruit and vegetable markets)	5	10	5
Cultural areas	3	5	
Health	1	1	
Removal of soil and rock			14
Dumps	1		4
Others (sports infrastructure, government, defense, etc.)	2	5	5

Decree 1736/1992 and Ordinance 1297/1992). On the other hand, the proliferation of precarious settlements (Table 4) took advantage of vacant lands, either due to their legal status (fiscal or irregular private dominion parcels) or to degraded conditions (old or illegal waste disposal landfills, wetlands) (see for example, Almansi et al., 2010). The most populated was the Villa 31 with over 30,000 inhabitants, settled in Commune 1 by the ACBA downtown.

The municipalities have followed different conceptions about leisure and recreation. A few of them have traditionally valued the public coastline and provided long boardwalks, while others reduced the free access to scattered disconnected walks within a

mosaic of other uses (Table 2). The rural/natural matrix was replaced by the artificial urban landscape in ACBA and NMC (Table 4). Several natural or semi-natural fragments were declared as conservation areas during the 1990s under the influence of the newly introduced environmental national and provincial legislation (Table 2). Low terrace wetlands and remnants of the Paranaense forest were protected only in Quilmes and Berazategui; in the other municipalities, the reserves were isolated patches based partially or fully on reclamation grounds (Fig. 4).

The refunctionalization of port areas through public-private partnerships has gained importance in the last decades. The reconversion of Puerto Madero (ACBA) has been considered a globalization landmark. The national government transferred the ownership to a public limited corporation, the Corporación Antiguo Puerto Madero Sociedad Anónima (CAPMSA), the shares equally divided between the city and the nation. The renovated district occupied 170 ha and combined the modern profile with the historic and environmental patrimony (Keeling, 2005; Garay et al., 2013). The land prices escalated more than 20-fold between 1990 and 2016, ranking among the most expensive of the GBA. Similarly, the renewal of Tigre port spaces and the San Fernando Nautical Park revitalized the northern coast, but other large urban projects in San Isidro, Avellaneda, Quilmes, Berazategui and Vicente López found vehement opposition and derived in prolonged legal conflicts.

4.1.3. Social-environmental impacts

The ACBA coastline became completely artificial due to the port infrastructure, the urban growth and the successive infillings. The coastline progressed up to 2 km into the river from the natural cliff where the city was founded, adding in 2500 ha (López and Marcomini, 2004). The Riachuelo River, southern boundary of the capital, was rectified and the other major streams (Maldonado,

Table 4
Rural/natural, industrial and residential uses, gated communities and slums in the Great Buenos Aires coastal zone. ACBA: Autonomous City of Buenos Aires; NMC: Northern Metropolitan Coast; SMC: Southern Metropolitan Coast. Source: present work data.

	Rural/natural uses	Industrial uses	Residential uses	Gated communities	Slums
NMC					
Tigre	low-density	low-density	low-density	14	5
San Fernando	–	low-density	low-density	8	3
San Isidro	–	–	low-density	5	1
Vicente López	–	–	high-density	–	1
ACBA Coast					
Commune 13	–	–	low-density	–	–
Commune 14	–	–	low-density	–	–
Commune 2	–	–	high-density	–	–
Commune 1	–	–	high-density	–	4
Commune 4	–	medium-density	low-density	–	–
SMC					
Avellaneda	low-density	high-density	–	–	3
Quilmes	medium-density	–	low-density	–	4
Berazategui	high-density	–	–	3	–

Medrano, and Vega) and the minor watercourses crossing the ACBA were rectified and tunneled. Similar artificialization trends were observed all along the coastline except in Berazategui.

The structure of the drainpipe system, the coastal defenses, the habitat destruction, the soil imperviousness, the road construction, the tunneling of streams, and the invasion of the low terrace changed the surface runoff, increasing the frequency and extent of flooding events (Clichevsky, 2002; Pereyra, 2004) with seventy-six registered between 1905 and 1994 (Etulain, 2004). The 'sudestadas' (Section 2.2) often caused massive evacuations of coastal residents. Infrastructure such as the elevation of the Riachuelo river banks above the historical flooding level, the installation of a sewer to convey the water flux towards pumping stations, and the construction of embankments and seawalls (Pousa et al., 2013) alleviated local impacts but the at-risk of flooding population continued to increase due to the densification of the slums and their expansion to other wetlands, as seen in ACBA, Tigre, Avellaneda and Quilmes. The sanitary problems, the social vulnerability and the economic losses escalated as the upper hydrographical basin changed from rural to urban uses, the permeable soil diminished and the infrastructure on the low terrace became less effective (Pereyra, 2004).

The sanitation networks and the more than twenty thousand industrial establishments (Garay, 2007: 127) poured down the effluents into the rivers and streams flowing to the Río de la Plata. The surface waters were polluted with wastewater, coliforms bacteria, nutrients, suspended material, organochlorine pesticides, polychlorinated biphenyls, aromatic hydrocarbons, etc. (FREPLATA, 2004; Fernández Cirelli and Ojeda, 2008; Kopprio et al., 2015). Bathing and swimming in the Río de la Plata have been prohibited since the 1960s. Domestic water supply, nautical sports, recreation activities and landscape enjoyment were also particularly affected.

The coastal rural and remnant natural systems were menaced by residential uses, recreation activities, sanitation and waste management (Morello et al., 2000). The gated communities coexisted with low-income, precarious settlements; both alternate in a mosaic of segregated residential patches with unequal access to services, sanitation systems and levels of urban quality (Michellini and Pintos, 2016) and competed for the occupation of the low fluvial terrace. The gated communities as enclaves walling off their perimeters increased the flooding surface, aggravated the pollution of the streams, reduced the local connectivity and restricted the mobility of the neighbors. The effects were always asymmetric: the most severe damages fell on the extramural settlements and they requested government aid, while the gated communities had the

capacity to deal with these conflicts without external assistance (Michellini and Pintos, 2016).

4.2. Do local governments have the appropriate capacities to manage coastal issues?

4.2.1. Coastal legislation and competences

Regarding the legislation and competences directly related with the coastal dependent issues, the national Civil and Commercial Code (Law 26994/2014) instituted the limits between public and private domains in the coastal zone and the national Law 25675/2002 established the minimum guidelines for the environmental management. The national government was responsible for the water, sewage, power and natural gas supplies; the national road network; the railway system; the New Port administration; the Puerto Madero neighborhood urban services; and the control of the nautical activities. During the studied period, some root-and-branch reforms of the Nation competences involved alternatively monopolization, deregulation, liberalization, contracting out, privatization and re-nationalization. One of the most complex examples was the water supply and the sanitation services, pertinent for our analysis since both use the Río de la Plata as source and sink, respectively. A national institution was created in 1912 to provide 'universal services' to the capital area. The continuous expansion of the networks slowed down during the 1950s, and some services were transferred to the BAP in the 1980s (Botton and Gouvello, 2008). Because of the tendency to question the efficiency and desirability of public monopolies, the Nation granted the concession for the services to a private consortium in 1993 but they were renationalized in 2006. At the end of our study period, the water supply and sanitation were under national administration, except in Berazategui. The GBA infrastructure and other services like the electricity supply, gas supply, telecommunications, railways and subways were also centralized by the national state from the 1940s - 1950s to the 1990s, private during the 1990s - 2000s and then public again. Coincidentally, during the same period the rate of privatization slowed down in Europe and Latin America, where nationalization or renationalization was taking place in a significant scale (Quiggin, 2002). The debate between public or private management was far from being solved and a new repetition of the cycle appeared to have started in 2016.

Despite the change of jurisdiction of the capital from the national administration to the autonomic status in 1994, the interest of the national administrations in the coastal zone of the city persisted. The successive national administrations maintained some

incumbencies, such as the management of the port areas and activities, and the promotion of megaprojects, like the bridge linking Buenos Aires and Colonia (Uruguay) —a binational project that passed through different versions from 1972 to 2005—, the offshore airport on an artificial island (1995–1996), and the construction of an Audiovisual Pole on the Demarchi Island (2012–2015); all of them were abandoned after heated debates.

The provincial laws regulated the environmental and hydrological basins management (Laws 11723/1995 and 12257/1999, respectively). The Decree-Law 8912/1977 established the general land use framework, but planning and control were delegated to the municipalities and the sanction of the urban code for each locality was the responsibility of the respective municipality.

Regulations for the economic activities were non-specific for the coastal zone, with the exception of the laws, decrees and ordinances that addressed the coastal-dependent ones like ports, fishing, navigation and beach tourism. Sectorial policies increased the non-coastal dependent land uses, incremented the conflicts (such as those between the ports and their surrounding urban areas) and intensified the habitat deterioration. As a rule, most interventions in the coastal zone were disarticulated even within the same jurisdiction, focused on immediate circumstances and implemented from different dependences without coordination. Inconsistencies in the implementation of the sectorial policies were frequent. For example, the New Port (ACBA) and the Dock Sud Port (Avellaneda), formerly part of the same complex, operated instead under entirely different terms (national and provincial management, respectively) and competed with each other.

4.2.2. Interjurisdictional arrangements

After the restoration of the democratic institutions, the capital, the provincial and the national governments signed an agreement to create the Metropolitan Area for the management of the trans-jurisdictional resources in 1984. A few years later, the Comisión Nacional del Área Metropolitana de Buenos Aires (National Commission of the Buenos Aires Metropolitan Area) was set up by the national government (Decree 2064/1987) to harmonize the separate administrations of the capital city, the BAP and the municipalities, however, it never fulfilled the projected objectives (Garay, 2007).

Basin committees, including some of the studied municipalities, were created for the Reconquista and Matanza-Riachuelo rivers (Comité de Cuenca del Río Reconquista, provincial Law 12653/2001 and Autoridad de Cuenca Matanza-Riachuelo, national Law 26168/2006, respectively). At the end of the studied period, they were still active. Their functions were limited to control, coordination, cooperation and promotion. With weak management capacity, they produced scarce results (Garay, 2007: 179–180).

Seven bills for the establishment of Coastal Management Programs were introduced into the national legislature from 1995 to 2015 but they all failed. In the academic area, research papers and technical reports, such as Etulain (2004) and FREPLATA (2004) among many others, proposed guidelines and recommendations for the implementation of national and/or regional ICZM programs.

The BAP government created the Land Use Planning Program (Resolution 3207/2005), the ICZM Coordination Unit (Decree 1802/2008) and worked on a participative draft project for a coast management law from 2009 to 2015. Even when supported by a sound technical basis, these attempts were inarticulate, failed to cover the totality of the metropolitan extension and lacked a consistent political support, turning them into inoperative; remarkably, the municipalities were assigned only advisory, non-executive functions in all of them (Gutiérrez, 2012).

The BAP faced a different, gradual approach by clustering the municipalities into regions. The Northern Metropolitan Region

(Vicente López, San Isidro, San Fernando and Tigre) was created in 2000. The first decisions of the intermunicipal consortium were related mainly to transit, marketing, health care and communications. The Consorcio de Municipios del Conurbano Sur (COMCOSUR) was created in 2004, including seven municipalities (the three SMC ones included), with central interest in environmental legislation, social development, consumer protection, economy, traffic, and enforcement. The COMCOSUR was re-launched in 2011, 2012 and again in 2016; beyond the political effect of the cooperation announcements on the media, the results proved to be still uncertain. The mayors of both the Northern Metropolitan Region and the COMCOSUR were concerned in reassuring their autonomy and declared in many public statements that their intention of integration would be reserved for questions where union would be strategically advantageous, like carrying out a negotiation with more powerful counterparts. It is significant that the mentioned counterparts were always the state organisms (province, nation) instead of private companies or transnational corporations (see also Section 5.1).

4.2.3. Financial capacity

The country's economy followed a cyclic pattern of rises and depressions and the institutional system has suffered several breakdowns during the twentieth century. The last one occurred in 2001 and it was accompanied by rising unemployment and an increase of at-risk, low-income populations (see for example Pérez, 2012). As part of public spending cuts and a downsizing policy implemented by the national government, several public services (education, health, etc.) were transferred to provincial governments. In turn, the BAP government extended new roles to municipal administrations without the concomitant transference of resources. Such changes reassigned the deficit to the municipalities, deprived their finances and made them helpless both to face their compromises and to maintain their functional structures. In addition, the municipal administrations had to undertake the social and environmental impacts of the actions that the supra-municipal levels performed in their territories, such as those derived from the modernization and expansion of the infrastructure, industrial and port areas, which frequently collided with previous uses such as natural resources preservation, recreation and tourism.

The analysis of the 2016 budgets showed that the main sources of financing were the local direct taxes on personal and commercial goods, and the municipal services such as public lighting, street sweeping, trash collection, maintenance of public roads and communal spaces, etc. However, the local revenue did not cover the total outlays; for example, they provided only 80% in Vicente López, 72% in Tigre and 65% in San Isidro, three municipalities that were among the richest. Municipal administrations have mainly sought to develop social policies carrying out welfare plans designed and financed by the national and provincial governments. The municipalities oriented their actions by the supply and not by the local necessities, losing initiative because the essential resources that they needed were tied to programs in which they had no power of decision. An example was the Restitution Fund for metropolitan municipalities (national Law 24073/1992 and provincial Law 11247/1992). The funds came from a national tax administered by the provincial executive branch and went to the local NGOs and civic associations to finance eligible local projects (health care, public infrastructure, public education, welfare, etc.). This competence increased dependency instead of autonomy (Pérez, 2004). The municipalities were only 'mediators' or 'enablers' and this institutional structure has been interpreted as a new recentralization (Danani et al., 1997), a clear internal contradiction to the direction of the intended contemporary reforms of decentralization (Section 5.1).

4.3. How did planning processes enhance the coastal zone quality?

A comprehensive planning process has never been attempted neither for the coastal fringe nor for the whole megacity. The first urban plan was formulated for the capital city in 1925. Broader, the Regulator Plan for Buenos Aires City (1962) situated the capital city as the core of an interdependent national network of urban nodes and proposed the first metropolitan guidelines. It identified the coastal zone as an urban axis, and organized the expansion along a coastal highway. Since this novel approach did not take into consideration the interests of the other GBA actors, it was readily abandoned.

The provincial government was also unsuccessful while implementing interboundary initiatives on its own jurisdiction. The Strategic Guidelines for the Metropolitan Region (Garay, 2007) proposed integrating the GBA through the services and infrastructure networks. The initiatives for the coastal development, which were never implemented, were limited to connecting the North and the South through a transportation corridor and achieving a better balance in the relationship between the ports.

Urban planning processes in the country peaked during the 2004–2014 period with strategic plans including guidelines for future interventions in the coastal zone developed in ACBA (2004–2011), Avellaneda (2006), San Fernando (2007) and Quilmes (2008). Large urban projects and degraded areas recovery were still the focus, manifestly lacking an integrated approach.

A remarkable ICZM initiative was the Buenos Aires y el Río (BAR) program. It was formulated for the ACBA coastal zone through a participative process by the first administration. The performance of the program was closely associated to the financial sources (Fèvre and Dadon, 2011). During the first period (1997–2002), it was implemented by an autonomous unit and it reached a high percentage of the objectives with the Inter-American Development Bank (IDB) and own financing. In the second period (2003–2007), a new political staff reoriented the objectives and it moved the program to different positions inside the government chart. The program sustained due to the IDB provided partial financing. During the third period (2008–2009), the planned actions were assigned to disperse branch offices and, lacking a specific budget, none was carried out. Since 2015, the program has been inactive without having been officially discontinued.

5. Discussion

5.1. Coastal management crossroads

The results of our analysis on the GBA megacity showed that, in the absence of a specific littoral public policy, the coastal development during the 1970–2015 period was not oriented to take advantage of the specific coastal potentialities. The management model responded to longstanding dichotomies that dominated the political arena: a) the antagonistic pair “metropolization - decentralization” regarding the interjurisdictional integration; and b) the “nationalization - privatization” duality, depending on the management agents.

The centralistic model prevailed during the post-war industrialization period (Quiggin, 2002). As in many countries, the management functions were nationalized in the GBA under the political imperative for a stronger national role. Some assumptions that grounded this model were that only national standards could regulate environmental impacts and prevent the competition among municipalities to tailor environmental standards to meet the preferences of the private actors (Lowry, 2000; Berwick, 2007). It was expected that the national officials would be more able to resist the influence of lobbyists. The top-down approach produced

metropolitan plans supported by solid technical background (Section 4.3). However, due to the centralist vision and without wide political and social consensus, the plans stagnated in the diagnostic stage and easily turned into academic exercises without further application. The implemented coastal projects were either limited to the traditional idea of engineering the shoreline to prevent erosion and flooding (Section 4.1.3), or they were centered in non-costal dependent large infrastructure (urban equipment, industrial poles, university campuses and services networks) (Section 4.1.2) with scarce or null integration with other complementary activities. From the present perspective, those guidelines underestimated the value that the coastal zone would gain in the future.

After the end of the dictatorial military governments and the restoration of the democratic institutions in 1983, the local private interests converged gradually on the coastal zone, raised its economic, social and cultural value, and motorized the space demand, the pressures on the environment and the conflicts with the public uses. The reconversion of Puerto Madero and the creation of the San Fernando Nautical Park (section 4.1.2) were early examples of public-private alliances that followed the urban state market logic rather than state plans for coastal development (Cuenya and Corral, 2011).

In the 1990s, the national and provincial governments carried out a deep institutional decentralization, based on premises like efficiency, transparency, celerity, modernization (Danani et al., 1997; Lowry, 2000; Rojas, 2005: 44) and stronger economic performance (Grassmueck and Shields, 2010). It was argued that the monocentric systems were dominated by ‘insiders’ who competed for privileged access to governmental authority in order to obtain selective benefits. Instead, polycentric systems would allow opportunities for non-governmental actors to enter productively into the governance process (Feock, 2004: 33). Due to the rapid implementation of the reforms, at the end of that decade, Argentina was considered one of the most decentralized countries of Latin America (Rojas, 2005: 44).

Even when the decentralization accentuated the institutional fragmentation in the GBA (Botton and Gouello, 2008) and the convergence with the recurrent economic crises weakened the municipal governance, the reforms gained consensus among municipalities. Kaplan (1998) suggested provocatively that, wherever the city is fragmented in separate municipalities, the decisions concerning the urban environment are increasingly taken behind closed doors in the boardrooms of companies. A prevailing focus seemed to be the question of local control (Purcell, 2001). In fact, guarding of land-use authority has been the primary barrier to metropolitan political consolidation in the post-war era (Teaford, 1997). Under decentralized management, the smaller municipal units retain greater control over their affairs (Miller, 1981; Weiher, 1991: 13; Lowry, 2000) and political fragmentation allows residents to avoid being subsumed into larger units, which would dilute their ability to control their local area. The most significant local function that small municipalities offer is authority over land-use decisions that allows wealthier cities to exclude land uses that they find distasteful or threatening and at the same time, to promote certain wealthy associated land uses. The market dynamics takes pre-dominance over public services, displaces previous specific coastal-dependent uses and incorporates the coastal space as urban/recreation vacant. The consequences of this process can be seen in the San Fernando - Tigre municipalities (Section 4.1.2), where 74% of the public coastline became private (Fig. 5). The sport, nautical and boating clubs were benefited with extensions of the concession areas and prolonged contracts, and the clubs and gated communities limited or prevented public access to the coastline. The (undeclared) tolerance of the municipal agents allowed homeowners to close public accesses, streets and even touristic vistas in

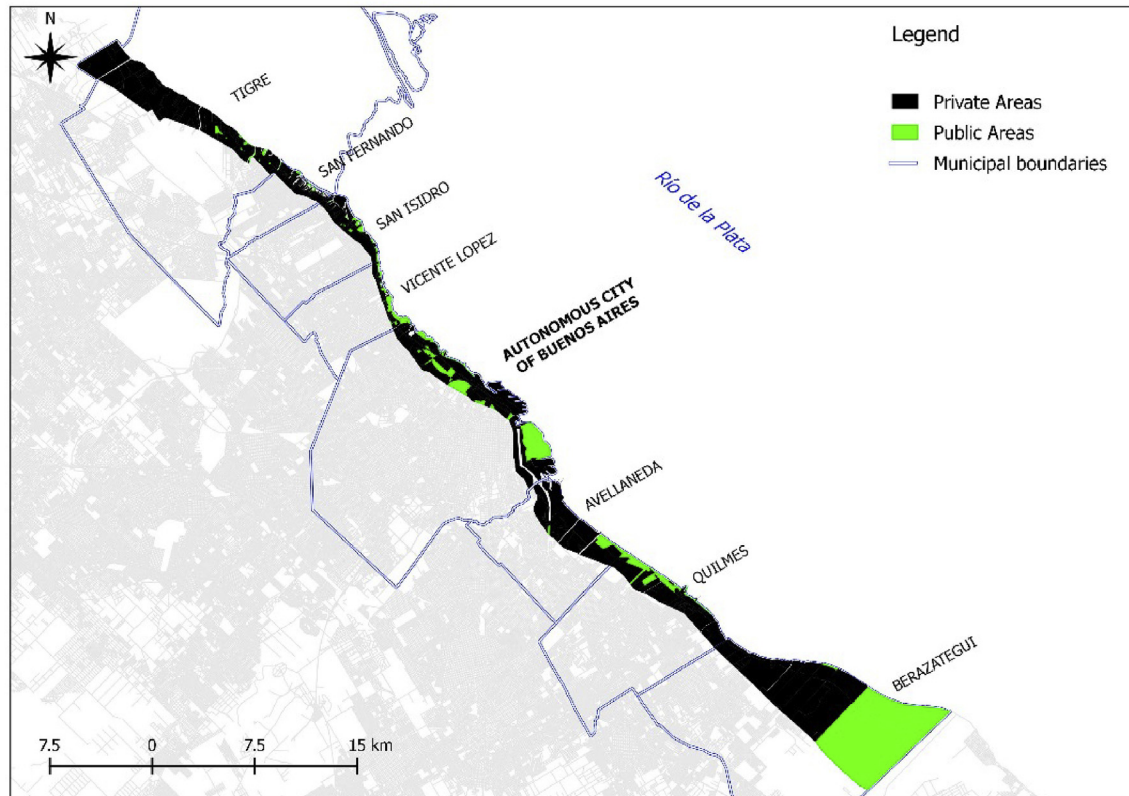


Fig. 5. Public and private areas in the Great Buenos Aires coastal fringe. Source: present work data.

the low-density residential zones while at the same time it devitalized the defense of the public. The apparent absence of conflicts reinforced the impression of accomplishment. The resignation of the state responsibilities, frequently on the edge of statutory, by means of partnerships with the corporate sector (Wilson and Wiber, 2009) and long-term large-area concessions, gained local political acceptance at the expense of an almost complete privatization of the coast. Stepanova (2015) found that the municipality proved to be the most powerful actor and decision-maker in the coastal conflicts, but under this management style, the presence of the state masked the use conflicts without necessarily serving the public interests.

The privatization of most of the coastline, the increment of real estate investments, the reduced response of NGOs, the absence of incentives for intermunicipal cooperation and the reduction of state governance were central issues in the tensions inside the GBA coastal management. Whereas in theory the reduction of the role of the state and the decentralization could be beneficial in certain specific contexts, in practice they seemed to collide with the objectives of interjurisdictional and intersectorial integration. From this study, it is clear that the local and short-term issues tended to prevail over the regional and mid-term ones. The administrative decentralization of the GBA produced regulatory dispersion, governance weakness and, more dramatically, coastal degradation. The political boundaries did not include the entire spatial range of the ecological processes, and the delegation of the large-scale primary provincial incumbencies to the smaller municipal units was counterproductive since it resulted in diluted responsibilities and weak decision power. In addition, the macroeconomic shifts, the disparity of interests and the absence of regional coastal management policies did not contribute to the achievement of solutions for environmental problems (Section 4.1.3). The reclamation ground in the NMC and ACBA coastline camouflaged the coastal

environmental dynamics and it caused the loss of native biological communities, the suppression of most ecosystem services and the complete artificialization of the landscape. An explicit, mandatory ICZM approach is imperative as the only way to improve the environmental quality, and it should be intended as a final objective, even if the course to accomplish it may be tortuous. Innovative, partially participative and moderately successful, the BAR program (Section 4.3) showed the existence of local capacities that it should be promoted by top-down mechanisms involving the highest state levels and *ad hoc* legal instruments.

5.2. Management alternatives

The GBA coastal management proved to be local-oriented, uncoordinated and even competitive through jurisdictions. Federalism is only one of the concurrent factors that explain the interjurisdictional agreements being such an elusive goal. Integrative plans have been proposed since the 1960 decade (Section 4.3); though ineffective, laid the foundations for a wide metropolitan vision. Bearing more oriented objectives and a narrower geographic extension, the ICZM approach entered the national political agenda after the Río 92 and Agenda 21 guidelines, through bills and regional programs. Even though the laws failed, some regional programs were implemented in the GBA (Section 4.2.2) and other regions of the country (see for example Fèvre and Dadon, 2011). Despite their initial success, most of the programs were discontinued in part due to the lack of financing but mainly because of decentralization policies. The impacts of the globalization reinforced by local political dynamics favored the decentralization (Section 5.1) rather than the metropolitan integration.

The analysis of the GBA patterns of population, services, land uses, jurisdictional competences and urban plans showed the absence of an explicit or implicit policy recognizing the coast as

clearly differentiated from the hinterland due to its environmental fragility, the predominance of public over private dominion, the social and cultural values and the strategic importance for local development. The coastal system became an empty space suitable for urbanization and assimilated to the vacant land of the hinterland. The residential uses outgrowing the productive and public recreational uses (as reproduced in the analyzed municipalities; see Section 4.1.2), the habitat artificialness, the loss of ecosystem services, and the privatization of most of the coastline revealed the prevalence of a vision pushed by the real estate interests. The main intervention tool has not been the ICZM nor the integrative metropolitan plan but the local-oriented urban project.

The persistence of problems such as chronic water pollution and recurrent flooding (Section 4.1.3), associated with pronounced economic and social losses, evidenced the inadequacy of autonomous, non-coordinated practices to deal with the environmental problems. Moreover, such issues will persist until an ICZM approach includes all the municipalities occupying coastal zone and the associated urban basins.

As a megacity case of study, the GBA is situated in one of the extremes in the wide spectrum between metropolitan integrated/autonomous decentralized coastal management (cf. Lowry, 2000) and may be considered as representative of the megacities under federal systems. Future studies of megacities under different institutional systems will provide data to contrast the performance of other coastal management models.

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Appendix A. Supplementary data

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