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Tourism Adaptation to Coastal Risks: A Socio-Spatial Analysis of the Magdalen Islands in Québec, Canada

Dominic Lapointe , Luc Renaud  and Mathias Emmett Blanchard *

Département D'études Urbaines et Touristiques, École des Sciences de la Gestion, Université du Québec à Montréal (UQAM), Montréal, QC H3C 3P8, Canada; lapointe.dominic@uqam.ca (D.L.); renaud.luc@uqam.ca (L.R.)

* Correspondence: blanchard.emmett_mathias@courrier.uqam.ca

Abstract: Coastal tourism is one of the most important segments of the tourism industry but is facing major impacts of climate change. In light of these impacts, the infrastructure enabling coastal tourism activities needs to be adapted. It is through the production of a space framework inspired by the work of Henri Lefebvre that we will reveal how a tourism space is socially constructing its own adaptation process. Using a case study methodology, we will examine the case of the Magdalen Island Archipelago in Québec, Canada, and pinpoint the subcase of La Grave. The case study will show how tourism is adding value to land dynamics to justify major adaptation work on the shore in order to protect the capital accumulation capacities of the tourism space. These justifications are buttressed by discourses of heritage and economic impacts to validate proceeding with a form of spatial reordering that privileges certain spaces while potentially leaving out others.

Keywords: climate change adaptation; tourism; production of space; Québec; Canada



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1. Tourism as a Coastal Activity

Coastal tourism remains one of the major segments of the world tourist industry; in fact, coastal and beach tourism is still the dominant segment in terms of number of tourists [1]. This type of tourism is part of a modernist social construction which has given birth to a stereotyped vision of coastal environments based on the 3S triptych, i.e., sea-sun-sand [2,3], showcasing long sandy beaches with blue sea as a leisure space. Historically, seaside leisure and recreational activities made their appearance early in the 19th century and cruises appeared later, in the late 1800s [4]. However, it was not until the end of the Second World War with the democratization of aviation that coastal tourism became a mass scale phenomenon. For instance, in 2005 coastal tourism generated 75 million visitors in France, 59 million in Spain, and 40 million in Italy [5]. Reinforced by the social myth of the right to holidays [6,7], this type of tourism has experienced constant growth since then and has led to an increase in the pressure of usage in coastal environments, particularly those that meet the aesthetic and climatic criteria conveyed by the tourist industry (sea-sun-sand), which are becoming coveted commodities.

Within the scope of this manuscript, we shall use the definition of coastal tourism provided by Tourism Development International [8]: “the sector of the tourism industry that is based on tourists and visitors taking part in active and passive leisure and holiday pursuits or journeys on (or in) coastal waters, their shorelines and their immediate hinterlands” (p.18). Although the term coastal water can refer to all water/land interfaces of lake and river environments, the coastal tourism which is referred to here is part of Orams’ [9] notion of maritime tourism, namely “those recreational activities that involve travel away from one’s place of residence and which have as their host or focus the marine environment”.

Our interpretation of the notion of “active and passive leisure” or of “recreational activities” refers to a multitude of uses of the coastal space made available to tourists.

These may include sunbathing, walking on the beach, surfing or sailing, fishing, diving or snorkeling, or observing the coastal flora and fauna. As for the notion of “holiday pursuits or journeys or travel away from one’s places of residence”, we include in these definitions both holiday tourists and cruise passengers as well as owners of second homes and day trip visitors to the coast.

These tourist activities depend on a transformation of the coastal space for the establishment of infrastructure for various purposes [10]. This transformation will also take place through the implementation of recreational infrastructure (marina, seaside boardwalk, etc.), as well as through uses that complement the tourist activity such as buildings dedicated to restaurants and shops. Including road infrastructure and the entire built environment (sanitation, communication, etc.), this set of infrastructure components will have significant impacts on the ecosystem balance of coastal environments as well as on the physical and geomorphological dynamics of the sea/land interface [11].

The very nature of coastal tourism, the pressure of which increases as one approaches the sea/land interface, makes it difficult to foresee a balanced cohabitation between tourism and the preservation of coastal environments. Pollution due to demographic pressure on the coastal fringe changes the coastline configuration, particularly by way of embankments that transform the dynamics of currents contributing to coastal erosion; all such impacts undermine this fragile environment [12,13]. In this context, the various stakeholders in coastal governance and all stakeholders in the tourism industry must transform their growth-oriented, positivist development approaches in order to ensure the real sustainability of tourism [14]. While sustainable development approaches in the context of coastal tourism call for overcoming this developmentalist path dependency [15], a challenge of a completely different nature will drive the evolution of coastal tourism opportunity and attractiveness in the coming decades, namely climate change.

1.1. Climate Change and Tourism

The various hazards caused by increasing climate disruption include sea level and temperature rise, change in water regimes and atmospheric circulation, and the prevalence of extreme weather events linked to the rise in surface water temperatures [16]. These dangers have a variety of environmental, social, economic, and geopolitical consequences that we will not address in detail, but which ultimately affect tourism activity. Arabadzhyan et al. [17] categorize this regime of risks in terms of ecosystem services (degradation of the marine environment, forest fires, and loss of beach availability); comfort and health (thermal comfort and infectious diseases); and finally, in terms of infrastructure and services (damage to infrastructure, curtailed access to drinking water, and loss of heritage), therefore calling for a better understanding of how climate change adaptation will transform the production of coastal tourism space.

1.2. Beyond the Material Adaptations: Space Relationality and Climate Change Adaptation

A traditional analysis of climate change and tourism will usually include an impact assessment [18–20], a cost–benefit analysis [21,22], and a consumer behavior appraisal [23,24]. This perspective entirely misses the complex relational dimension of tourism with respect to the coastal environment, i.e., an entanglement of social relations, policies, and imaginings, therefore providing an incomplete picture of the impact of climate change on the coast [25–28]. To include this relational dimension, we will turn toward the theory of the production of space [29] to address this knowledge gap and highlight the socio-spatial dimension of coastal tourism adaptation to climate change. Indeed, space is a central component of everyday life and of material and symbolic productions, therefore calling for a better understanding of how the spatial dimension is constructed and used [28–31].

Space cannot be considered as an empty and neutral receptacle of social action; in fact, social relations influence space while space influences social relations. Space is socially produced and is fluid and transformative [29]. To analyze these spatial dynamics, Harvey [32,33] underlines the importance of the relational dimension of space, which

encompasses all the meanings and relations that foster our understanding of it. Relational space defines who can do what in space, i.e., the conditions of social relations therein. We will focus on this third form of space to understand the challenges of and adaptation to climate change in the area of coastal tourism.

To delve more deeply into the sociospatial dynamics of relational space, we will use a three-tier conceptualization of space (see Table 1), namely perceived space, conceived space, and lived space [29]. Perceived space is grasped by the senses during involvement in spatial practices, i.e., what people do in a given place; in other words, the focus is on how space is perceived in practice with its physical constraints, taking into account the sensory understanding of the practitioner. Perceived space also encompasses bodies in space, their mobility, and positionality [34,35]. In relational space, it refers to how sounds and smells are experienced, as well as the raw potential of what is physically in a given space (energy, economic resources, and the like) [32].

Conceived space is the space of representations, mostly stemming from institutions. It refers to how space is abstractly represented through maps, images, plans, policies, and various types of discourse. This is the space of the processes of appropriation by institutions of different sorts and scales. In relational space, it refers to the codes used to make sense of these representations. It also includes the different forms of relations, i.e., social relations, symbolic relations, and power relations.

Lived space is the space of the habitus, of a deep understanding of daily life [29,36]. It is the space of dreams, of resistance, and of domination; it is the bridge between physical space and the symbolic realm of the objects included therein. It is the space of history, identity, and the meaning of use values. In relational space, it refers to all the representations of the different users of space as well as to the internalized values at play in the use of space. It is also the space of the imaginary realms of tourism [37,38] where the social construction of tourists is unfolding in a dialogue between their desires and the actual tourism space that also serves as a daily life space for residents, and therefore as a different lived space.

Table 1. Three-Tier Conceptualization of Space.

Three-Tier Conceptualization of Space	
Perceived space	Locus of experience, interactions of senses with space. Mobility and restraint.
Conceived space	Representation of space through maps, images, and blueprints for land use planning. Symbolic representations of space.
Lived space	Daily life routine in space, history, and identity in space.

Authors' compilations derived from Harvey [39].

As climate change and the coastal hazards associated with it transform coastal space, it also impacts representations and uses of coastal space [25–28,40], thus transforming the (re)production of coastal tourism space and its highly symbolic values [41], especially within the actual economic system [42]. The purpose of this research is to highlight how tourism and climate change adaptation have intertwined at the material and symbolic level in the transformation of littoral space.

2. Materials and Methods

As the basis of our research, we used case study methodology [43] to identify and describe the spatial dynamics at play in the adaptation of coastal tourism to climate change. The selection of this methodology was particularly germane given that the research focused on contemporary events over which the research team had little control. Case study methodology was also an appropriate selection given its capacity to include various forms of data and evidence, such as official documents, observations, and interviews.

The Magdalen Islands archipelago is a mecca for coastal tourism in eastern Canada. Although subject to long, harsh winters, the archipelago enjoys a warm, sunny summer period with average daytime temperatures in July and August of 22 °C and a number of days regularly exceeding 25 °C, making it an important northern sea-sun-sand destination. A French-speaking Acadian territory that is part of Québec (See Figure 1), the archipelago is particularly cherished by Quebecers for whom the “Islands” are a kind of northern replica of tropical destinations during the short summer tourist season that lasts from mid-June to early September. Located in the middle of the Gulf of St. Lawrence, the 187 km² archipelago, with 12,010 inhabitants in 2016, is made up of seven islands, six of which are connected by long sandy spits sheltering large shallow lagoons. Accessible by plane or ferry, this environment has experienced a significant tourist boom since 2005, becoming a prestigious destination due to its environmental setting and unique cultural offering [44]. The successful tourism development of the archipelago is nevertheless quite recent, dating from the middle of the 20th century, compared to other coastal destinations in Québec, which date back to the mid-nineteenth century [28].

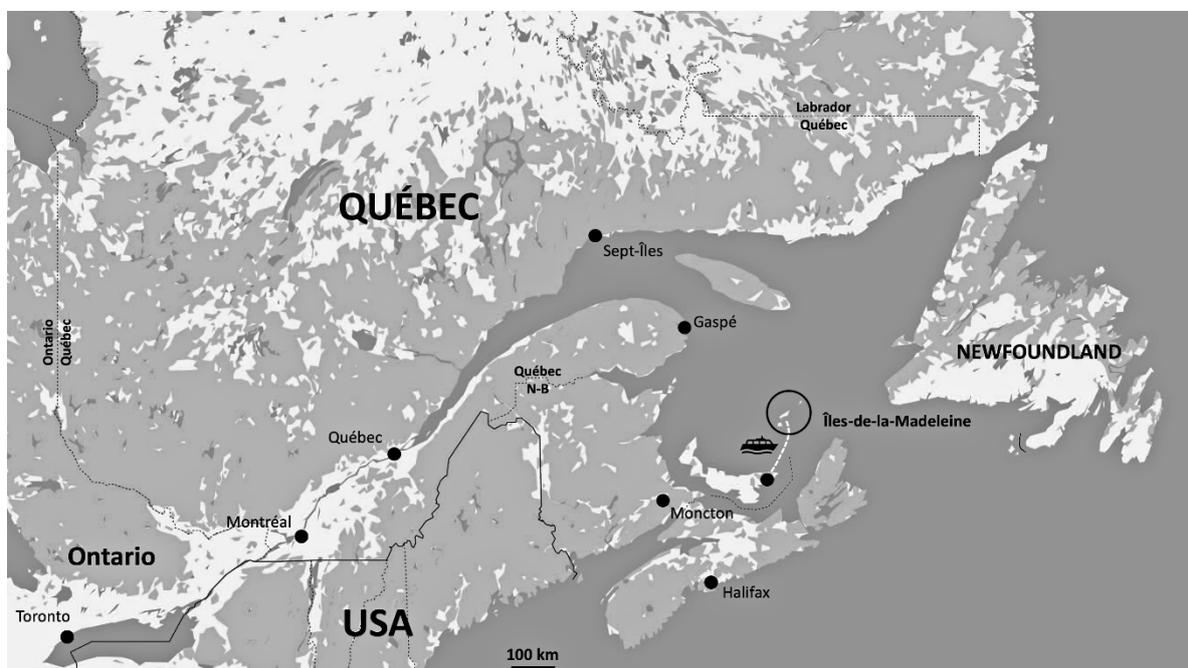


Figure 1. Localization of Îles-de-la-Madeleine (Magdalen’s Islands).

The tourism figures for the pre-pandemic season in 2019 showed 68,000 visitors, 12% of whom arrived by air [45]. Although this is a visitor/population ratio of 5.7, a figure comparable to what has been noted in various Caribbean islands, the fact remains that the islands received 69% of their tourism in eight short weeks (July, August). This summer concentration, which places a significant burden on the archipelago’s living environment, raises social and environmental issues related to highly concentrated tourism, including road infrastructure, drinking water, hospitality, and other related elements. The tourism activities characterizing the archipelago differ only in detail from the coastal tourism activities that can be observed elsewhere in the world, although one cannot speak of over-tourism on the scale of certain seaside destinations (Cancun in Mexico, Punta Cana in the Dominican Republic, La Costa del Sol in Spain, and the like). Nevertheless, tourism is no less vital to the local economy, being—along with fishing—the main economic activities of the archipelago [44]. The Magdalen Islands rely on coastal space and resources to attract tourists. They have seen a transformation of their coastal space due to climate change and development pressure. Therefore, they provide an appropriate case for research designed to identify, document, describe, and analyze spatial processes of tourism faced with a

changing climate and environment. Through our analysis, we will address the case of the archipelago as whole and then focus on the sub-case of La Grave (see Figure 2), which is a signature area for the local tourism industry, and also a region that has been strongly impacted by climate change.

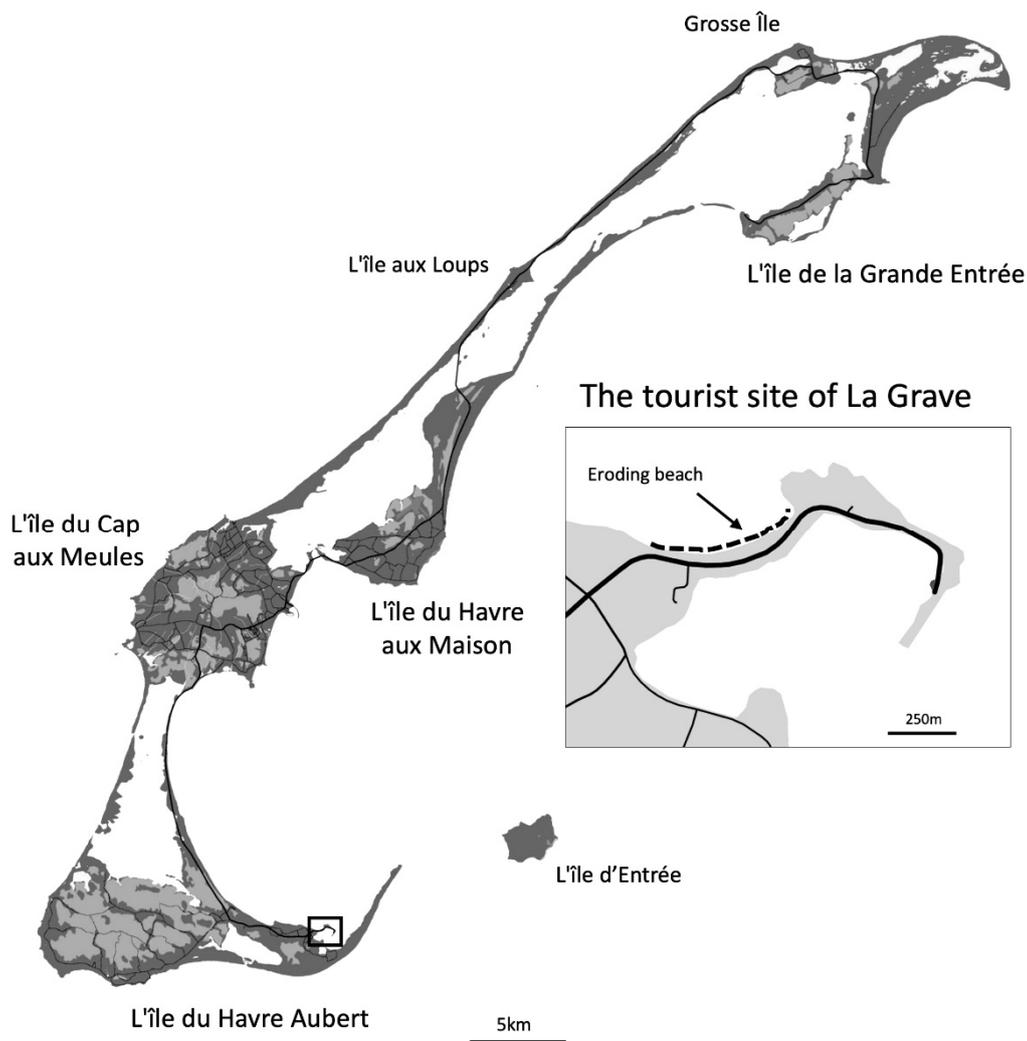


Figure 2. Localization of the Tourist site of La Grave.

To identify the spatial processes at play in the coastal communities, we analyzed discourses [46] of various stakeholders, including local development authorities and residents; environmental discourses; and tourism promotion discourses. (By discourses we mean languages, images, and symbols organized to represent reality.) These discourses were uncovered in official documents ($n = 28$); by way of semi-structured interviews ($n = 15$); and through extensive field work observation (four years). The field work was done through repeat travel to the archipelago in the last four years (six trips, average stay of six days) and regular exchanges with local tourism authorities. The observations were chronicled in journals with a focus on the topics of living with the changing dynamics of the Gulf of St. Lawrence, tourism development, and adaptations. The discourses were conceptualized as one moment in the social processes internalizing all other social moments (power, values, institutions, material practices, and social relations) [33]. They were selected on the basis that they were culled from recognized stakeholders in tourism, land use planning, and climate change. The interviews were conducted in person at a location selected by the informants. The questions revolved around four themes: tourism activities

and resources; perception of climate change; adaptation and vulnerability perception; and spatial transformation. All the interviews were recorded and transcribed.

The data corpus was analyzed with NVivo 11 using thematic textual queries and systematic coding. The official document corpus, the interview transcripts, and the fieldwork journaling were in French and the coding as well. Therefore, from now on, the references to this corpus will be the author's translation. Using multiple sources of data, we will refer to interviews as *Interview X*; to the journaling as *Field Notes*; and to information from local documents using a traditional *Author: Date* system. The queries enabled the researchers to pinpoint specific words out of the corpus and extract them with their textual context. The textual queries were not used in a statistical manner, but instead to identify the relevant extract of the corpus, especially in the 228 official documents, some of which were quite voluminous. The terms used were Climate, Climate Change, Erosion, Submersion, Risk, Shore, Coast, Tourism, and Heritage. Then we extracted all the quotes and field notes about the case and reconstructed it [47] through the production of the space framework described earlier, using a narrative aggregation strategy to turn the many discourses into a readable format and to protect the informants' anonymity.

3. Results

The results are provided in three steps, first in a presentation of the scientific discourses on the impacts of climate change on the archipelago; then in how the archipelago is produced as a tourism space at the intersection of desires for water and capital investment; and lastly in an analysis of the particular area of La Grave, which is an important site for tourism that will be transformed in the coming years to protect it from erosion and submersion.

3.1. Climate Change and the Magdalen Islands

A proper understanding of the current and ongoing effects of global climate change on the Magdalen Islands requires an assessment of the region's evolutionary climatic history. According to Bernatchez et al. [48], the Magdalen Islands experienced an ever-increasing rise in average winter temperatures in the 20 years prior to 2010. An increase in mean winter temperatures has been accompanied by a decrease in ice cover, a factor in coastal erosion. The Magdalen Islands are no strangers to erosion. Between 1963 and 2001, the region of Havre-Aubert and Cap-aux-Meules experienced an erosion rate of -0.46 m/year, while Pointe-aux-Loups experienced an erosion rate of -0.59 m/year [48]. Whereas Drapeau and Mercier [49] have shown that the Magdalen Islands are composed of extremely dynamic shorelines and are subject to coastal erosion regardless of climate change, Bernatchez, Toubal, Van-Wiererts, Drejza, and Friesinger [48] provide evidence that the dynamic nature of coastal erosion is strongly influenced by the effects of climate disruption. As such, with the ever-increasing impacts of climate change, the region has become highly susceptible to erosion. Relationships between coastal erosion and climatic parameters may therefore better explain the evolution in the Magdalen Islands' coastal erosion. Bernatchez, Toubal, Van-Wiererts, Drejza, and Friesinger [48] suggest that there are five relationships between climate change and erosion pertaining to the Magdalen Islands: an increase in storms; an increase in ocean water levels; a reduction in ice cover; changes in wintering processes; and changes in concentration of rain.

While climate change may be expressed through a variety of climatic parameters, global climate change specifically has the capacity to affect temperature and precipitation patterns; atmospheric and oceanic circulation; rates of sea level rise; and the frequency, strength, timing, and distribution of both hurricanes and storms [50]. With respect to the study region in question, research has shown that for both the Baie de Plaisance and Pointe-aux-Loups tombolo regions of the Magdalen Islands, periods of increased erosion correspond to a couple of time periods where the regions experienced an increase in storms [48]. The rain accompanying storms, especially those in winter months, can generate landslides and the tumbling of rocks/boulders [48], both phenomena altering the

region's littoral and cliff makeup. Next, a rise in ocean water levels has strongly affected coastal erosion on the Magdalen Islands. Coastline positions, expressed through either an advancement or a retreat in the shoreline, are highly affected by sea level fluctuations [51]. A study conducted by Church and White [52], in which the researchers extended the reconstruction of global mean sea level back to 1870, has shown that sea level rise has undergone a significant acceleration, thus providing an important confirmation of climate change simulations [52] where evidence for global sea level acceleration is provided by climate models of the Intergovernmental Panel on Climate Change [53]. Further research has shown that sea level acceleration started at the end of the 18th century, with sea levels rising by six centimeters during the 19th century and 19 cm in the 20th century, and levels are predicted to rise 34 cm over the course of the 21st century [53]. For coastal regions that are severely impacted by rising sea levels, such as the Magdalen Islands, these changes can have many impacts, including submersion of the intertidal zone which, in turn, may result in severe reductions in beach surface area. Bernatchez, Toubal, Van-Wiersts, Drejza, and Friesinger [48] have shown that on the Magdalen Islands, the increase in sea level has resulted in the reconfiguration of the littoral, where sediments have been moved toward the two extremities of the islands (toward the eastern point and the point of Bout Banc—Sandy Hook). Due to this transformation, the tombolo system is migrating toward the interior of the lagoons. Next, the increase in average winter temperatures due to climate change obviously results in a reduction in the formation of ice and, thus, of ice cover. The 1977–1983 and 2001–2007 periods have both been characterized as low ice cover periods on the Magdalen Islands [48]. As such, these are also periods during which significant decreases in total beach area have been recorded. The reduction in ice cover can drastically result in modifications of the dynamic sediment composition of the littoral. Due to the reduction in total ice cover, sedimentary compositions of the littoral are modified, resulting in an increased exposure of the littoral zone to winter storms. As such, the reduced ice cover at the bottom of the estuary causes beach erosion due to wave exposure, whereas a reduction in ice cover at the top of the estuary leads to the erosion of cliffs [48]. With increases in mean global temperatures, we may therefore expect more reductions in ice cover and thus heightened erosion on the Magdalen Islands. In line with the reduction in ice cover stemming from climate change, other wintering processes are also affected, including freezing/thawing and cryogenic processes. Importantly, coastal erosion, and in particular the erosion of cliffs, is strongly affected by climate change. Exposure of cliffs to direct sunlight, to increased frequencies of winter storms, to freezing/thawing cycles, and to warm winter temperatures all result in an increase in erosion. Rising winter temperatures reduce both ice cover and snow cover. In addition, the ice cover allows snow to build up on the littoral and protect the coast from further erosion processes [48]. However, a reduction in ice cover, coupled with a reduction in snowfall due to increasing winter temperatures, means that snow no longer acts as a protective thermal isolation barrier, thus leaving the coast exposed and subject to increased erosion.

As a result, the Magdalen Islands have been subject to vast increases in erosion due to parameters affected by global climate change. While it has been shown that climate disruption and its spin-offs have severely affected the study region at a steady pace over the last few decades, the effects of climate change are not predicted to slow down, but rather amplify. As erosion can lead to coastal squeeze, habitat loss, retreating shorelines, and the need for the building of protection structures, which in turn can jeopardize the environment's morpho-sedimentary equilibrium [51], it is evident that erosion (and in turn, climate change) has had various important negative effects on the Magdalen Islands.

These characterizations of climate disruption in the Magdalen Islands by the scientific community were echoed in the understanding of climate change, and climate change adaptation, exhibited by our informants. Indeed, in all the interviews, climate change was associated with coastal erosion and extreme weather events, while the necessity for adaptation was perceived at the infrastructure level, with respect to roads, the electricity network, and public buildings (Fieldwork notes, 2018).

3.2. The Desire for Water as a Spatial Relationality

Being an archipelago, the Magdalen Islands are surrounded by water. Throughout recorded history, life as a whole has been conditioned by the community's relationship to waterways, and residents have pursued focal spatial practices related to farming and fishing.

"We think at first that it [the human settlement] occurred randomly, but it did not. People settled on the edge of the bays where they could fish safely. They also left space for farming, because back then fishing alone could not provide for the needs of a family. This led to a particular way of living on the land that might appear somewhat anarchic. The residents' lifestyle also makes for the charm and beauty of the environment here on the islands." (Interview 3)

As another informant provides this observation:

"The rules were not formal back then; instead land use was contingent on local constraints, including wind, water, tides, and the like. Houses were not built directly along the roads or directly by the water. They were built on top of hills or small ridges so that water would naturally flow down and away from the houses. Those hilltops also offer views on the sea and the boats." (Field notes, 31 May 2018)

These two excerpts from our data set exemplify how water was something to manage in your domestic and economic activities. Located close to beaches and the water, the islands' buildings were mainly rudimentary and temporary structures related to fishing and fish conservation activities [54]. The example of the La Grave heritage site, which will be central to our analysis, is a testimony to the built structure of the traditional fishing era. In the contemporary era of tourism development, being close to the water has become a highly desired spatial position and the shore, a conceived space through representation of the landscape and of rupture from urban life, where lived space involves a close relationship with the horizon, the sounds of waves, and the saline effluvia of the sea. The space of risk and of economic activities (fishing and fish processing) has now turned into a space of desire and leisure, and even if the shore nominally remains public property in Québec, a sense of owning a piece of shore, or even better of a beach, has become of paramount importance.

3.3. Tourism as Value Fixing Activity

This transformation of the lived space and conceived space of the Magdalen Island shoreline and beaches has also changed the real estate dynamic of the area. Given the limited allotment of shoreline and beachfront property available for building, these become a space for fixing surplus urban capital in a second home. As one of our informants states,

"The value of the land is disproportionate; being on the waterfront, its value far exceeds land prices on the rest of the archipelago, so you can compensate for potential losses. Look, there's a cost benefit to being on the waterfront, but there's also a risk." (Interview 2)

Ways of dwelling on the archipelago have been developed over time, with a small demographic loss offset by an influx of newcomers seeking the proximity of water for their leisure time and retirement. The attractive landscape and views on the water create a difficult compromise to manage within the conception of space, where the perceived space of intangible value promoted by tourism discourses is translated in the conceived space into allotments and speculative land value, while on the other hand, this space is at risk from the sea and climate change [55,56]. The risk is incorporated in the conceived space as rules for construction, particularly as regards distance from the water for authorized building [57]. While these rules are evolving, climate change is transforming the lived space beyond the conceived space, creating issues for businesses and homeowners close to the shore:

"I have friends who built a house on the water's edge ten years ago. They were told to construct it 100 feet from the shoreline. To save money, they built the house 150 feet

away. In the first 5 years, they lost 30 feet of land. They had to erect a riprap to protect their house.” (Interview 4)

Therefore, with a rising price of waterfront real estate, as the shore is being reproduced as a leisure space of high intangible and economic value, climate change risks transforming waterfront property into a space to be protected instead of a locus of leisure and scenic value and undermining its primary economic value as the spatial anchor of capital invested in a second home and rental dwelling located in the vicinity of the shore.

In order to understand the intertwining of the threats posed by climate change and the production of tourist spaces, we need to mobilize the notions of space proposed by Harvey [33] and Lefebvre [29] which were discussed above. We will attempt to show how the questions of material adaptation, spatial relationship, and adaptation to climate change are expressed through the analysis of an absolute space, both emblematic of territorial development and symbolic of coastal tourism in the Magdalen Islands, namely the La Grave historical site. As detailed above, the idea is to combine Lefebvre’s notions of perceived, conceived, and lived space with Harvey’s notion of relational space.

3.4. The La Grave Historical Site: A Material Heritage

The La Grave historical site is located on the island of Havre Aubert. It consists of about thirty buildings on a tombolo with an average width of 50 to 60 m and it extends over a length of 440 m (See Figure 3). Occupied without interruption since the colonization of the archipelago in the 17th century, it was first dedicated to fishing activities. The original function of the buildings testifies to this past, where general stores, fishmongers, saltworks, tinsmiths, and the like were found on the site. The sandy formation has always been regularly subjected to the assaults of the sea (spray and flooding), and the characteristics of the buildings bear witness to attempts at countering adverse weather (raised constructions, use of cedar shingles). These characteristics give the site an important heritage value and have led to its recognition as a historic site by the Québec government in 1983 [54]. In terms of absolute space, the site has undergone a transition from being dedicated to proto-industrial fishing activities to being used as a tourist site that originally relied on the specificity of its built heritage.



Figure 3. The La Grave historical site (Photography Dominic Lapointe).

In fact, traditional fishing activities ceased in the 1960s to make way for tourism, which has developed rapidly over the past 20 years. The La Grave site is currently one of the major attractions of the archipelago's tourist offering. It is estimated that approximately 48,000 tourists [58] visit the site each year. The various buildings have been transformed into restaurants, bars, and craft stores that attract people out for a daily stroll; although some hotels are available in the vicinity, day visitors are most likely to be found roaming about the site. Although the historical nature of the site contributes to its tourist function, the museum and interpretive activities are only marginally involved in the capital accumulation function. In terms of relative space, the La Grave site is above all an important place for the circulation of people and goods, fostering a recreational tourist consumption of its seaside features.

A Space for the Safeguarding of Capital Accumulation

Although the site has always been subject to the assaults of the sea, the various climatic scenarios make this space particularly vulnerable in the short term, thus jeopardizing the accumulation capacity of this absolute space. Faced with such a direct threat, actions to protect the coastline have been elaborated in order to protect the site and ensure its sustainability. Different scenarios were considered, and the option of a beach recharge was chosen. Specifically, 35,000 m³ of gravel and pebbles will be used to raise the beach profile to a height of 3.4 m above mean sea level, an addition of approximately 1.1 m to the natural beach profile [59]. This will reduce the risk of overwash and flooding of the site during extreme weather events. The cost of the intervention was estimated at 4.7 million CAD. This representation of absolute space, of which we will only provide a brief outline here, is based on an array of feasibility reports, technical characterizations, and cost analyses that ultimately serve to support an exercise of relative space representation.

Indeed, the significant costs involved in preserving the tourist area require justification with respect to the importance of dealing with the threat being faced, i.e., to protect a site at risk of disappearing if no action is taken. In other words, the value of the site must be relativized in order to legitimize the decision by local authorities to proceed with the recharging of the beach, thereby mobilizing and regrouping all of the tourism actors and the local population around the objective of preserving the site. On the side of the local population, the importance of protecting the La Grave historical site is practically unanimous, being mentioned by all but one person interviewed:

"First, I am thinking of the La Grave historical site, which really must be conserved. Especially with everything going on now, the climate change issues and then the erosion, this is a site that needs to be looked after. I think this is the first site I would recommend to visitors when they arrive in the Magdalen Islands." (Interview 10)

"La Grave is a site known throughout the province. It has a socio-economic importance because it is a tourist attraction that people appreciate. So if we do nothing, the site will be badly damaged by the ever-increasing storms." (Interview 3)

"La Grave? Well, you've got businesses there; they provide work for local people. And it's an important tourism spot as well." (Interview 7)

Here, the representation of the space is based on a demonstration of costs and benefits using concepts and codes related to the tourism use function of the space as a source of revenue (See Figure 4), including such elements as economic impacts, social costs, annualized use value, and the cost-benefit ratio.



Figure 4. Tourism Boutique at the La Grave historical site (Photography by Dominic Lapointe).

The cost–benefit ratio is ultimately the key factor in selecting the protection scenario. The external consultants determined a ratio clearly in favor of beach renourishment. This decision is part of a context of representation of the tourist space that is expressed in various important facets of the (re)production of seaside symbolism that, as mentioned above, transcends the heritage quality of the site. The discourse mobilized through the various feasibility reports, which consists of highlighting history and local pride, hides an interest in preserving a seaside site that is justified in terms of its landscape value and its return on investment, the two elements being linked [22,58,59].

The cost–benefit ratio that guided the choice of the new beach is based primarily on an evaluation of the generated social impacts [22]. In the report of the consortium commissioned for the feasibility study, it is mentioned that the new beach will represent an added value to the natural beach and will generate greater economic benefits. The argument is part of the notion of second nature [30], as opposed to first nature, or “pristine” nature, where (re)produced nature ultimately contains more value or potential for capital accumulation than the space in its natural state. Overall, the consortium has mobilized this approach and these reflections during the exercise of (re)production of the tourist space. In other words, underlying the construction of the site representation is the idea that an artificial beach will be more beneficial to the lived experience of the space.

Ultimately, it is therefore a (re)production of the tourist space of La Grave that transforms the representation of spatiality in order to manufacture a lived space that meets the need for capital accumulation. From this perspective, it was unthinkable to adopt protection scenarios that would have proven more effective in protecting the tombolo, such as riprap, as any such approach would have affected the image and symbolic value of the beach, which is the most economically profitable representation. While the costs of protecting the site are now four times higher than the estimates of 2016, the exercise of relativizing

the value of the site has had to justify the cost overruns because the chosen model is the only solution for preserving the site while allowing for the creation of representation spaces in line with the expectations of all tourism stakeholders. The lived space, that is to say the represented space, to be experienced by tourists and the local population will respond to the need to escape, the desire to feel “elsewhere” but in a setting with familiar markers where the authenticity of the natural environment has supposedly been “improved”.

4. Discussion

The perceived, conceived, and lived space is seized in its absolute and relative dimension, exposing how the material, represented, and experienced dimensions of a site like La Grave can be projected in a relational dimension. This is what allows us to complete the matrix of spatialities at the core of the (re)production of space. Let us recall that relational space defines who can do what in space, in other words, it defines the conditions of social relations therein. Thus considered, space becomes a theater: a space of relations where the material dimensions, the representations and experimentation, the indices of socio-economic relations, the relations of power, and the symbolic representations of the (re)produced space are simultaneously deployed.

At the level of its socio-economic value, the perceived space has become the matrix of a very important relationship between the Québec state, local authorities, and the local population. This linkage contributes to the accumulation of state financial resources in the archipelago. Objectively speaking, the Magdalen Islands remain a relatively marginal, isolated, resource-poor, sparsely populated territory, whose production and territorial maintenance costs are relatively high. Few territories in Canada benefit from so much infrastructure investment in proportion to their socio-territorial importance. The value attributed to the territory obviously extends well beyond material relationships, because the “Islands” possess a historical, social, geographic, and political capital that not only benefits the Québec population and its decision makers but also other important actors as well.

The significance of this capital is combined with the efficiency of local authorities in proceeding with audacious financial arrangements to preserve the material and socio-economic integrity of the entire archipelago, La Grave being only a part of a whole that contributes to the concentration of financial allocations in the islands. Thus, the sums allocated to the protection of La Grave are relatively minor in scale compared to the various actions of preservation of the coastline against climate change. However, these investments must be sufficient to preserve the relationship with material space—the beach, the salt air, the sound of birds, etc.—as well as to ensure that the landscape as a whole remains propitious for relaxation, enjoyment, and ultimately consumption.

The preservation of this relationship is part of a system of representations of the site mediated by a set of power relations. At the heart of these representations is the notion of control of the imaginary realm of La Grave, of the power to define the symbolic and representative aspects that will enable a connection between tourists and tourist spaces. This linkage responds to a dynamic of entangled capital accumulation: the holders of the site are not able to accumulate the capital linked to the presence of tourists if they do not have access to government capital. In sum, the capacity for accumulation represented by La Grave is dependent on the influx of public money. But this accumulation capacity is also intrinsically linked to the skills and ability of local public and private tourism actors to mobilize enough socio-political capital to be able to extend their representational power to higher levels of government (provincial and federal) and achieve the goal of preserving the site. In concrete terms, local public and private tourism actors present the site above all as local heritage, as well as Québec heritage, that must be preserved, which is quite legitimate considering the heritage recognition given to this space.

The capacity and skill to rally political authorities around this aspect provides a strong identity anchor because well beyond its historical value, the site is from the outset a space with strong economic value. The strategic strength of this representation is important:

it responds to an imperative of economic development through the development of an activity (tourism) that replaces the artisanal fisheries which once provided a living for the locals. Here, the imprint of history thus serves to concretize the development project while giving credibility to the site. This credibility exceeds that of tourist spaces prefabricated from an absolutely empty space—for example, an amusement park or a fake fishing village—which would ultimately be disembodied spaces of pure consumption. The fact remains that the La Grave site is moving away from the living space it once embodied; henceforth, it is the local tourism actors who control its representation in order to offer a version of history frozen in its most lucrative iteration.

In fact, this representation of the space responds to a set of prerogatives linked to modern tourism that combine to embed the site in its function of capital accumulation. In this context, the actions of material preservation serve to ensure, at one and the same time, the historical, social, and economic sustainability of the site. By prerogatives, we mean the dynamics of production of space that are part of the establishment of relationships likely to reproduce symbols that meet the need for tourist experiences expected by visitors to the site. In this regard, we might consider in particular the importance of social networks and the imperatives of the “Instagrammability” of tourist spaces. In the case of La Grave, which corresponds to the sea-sun-sand triptych, the need to represent a relational space thus passes through a staging that draws on the imaginary realm of the tropical seaside fantasy: alcohol, music, joie de vivre, conviviality of the locals, nautical activities, and the like.

Thus, we have a powerful contradiction in which the preservation of the space of La Grave by recharging the beach supports a form of tourism that is hardly representative of the heritage aspect of the site (put forward nevertheless as a justification for preservation), while this approach helps maintain a form of mobility partly responsible for the problem of climate change. From a broader perspective, the challenge lies in seeing how the production of this type of tourist space in a destination that is certainly cultural but strongly balneal could be modulated to propose a spatiality more closely aligned with post-pandemic expectations that are sensitive to localism and environmental preservation.

Place is the *locus* of a complex web of social relations. From the economic sector through the five senses of its inhabitants, all elements come into play in producing space [29,33,60]. As we have shown in the case of the Magdalen Islands, space and its uses change through the assigning of values and meanings. The shores of the Magdalen Islands are exemplary in this regard, having evolved from a risky but productive space characterized by fishing activities, in a proto-industrial system, before being decimated by the industrial restructuring of fishing that has made locations like La Grave obsolete as a production site. The abandonment of fishing at La Grave has left the space to evolve into a hedonistic, value-laden space through postmodern tourism use. This sequence shows that space is perpetually redefined, as is what can be done by whom in such space.

Our work brings into focus how climate change has become a factor in the production of space. Environmental processes are always part of the production of space. Indeed, environmental processes are perceived by the users of space, with the impacts and presence of these processes being crucial to the conception of space as expressed through discourses while being experienced as they interact with the daily life of space users in both mundane and serious ways, ranging from decisions concerning what to wear on a rainy day to a more brutal interaction when extreme weather events radically transform a space, both physically and socially.

5. Closing Remarks

While environmental processes tend to be relegated to the realm of conceived space mostly because of their time span, sometimes their role in the production of space is more apparent. In the case we have developed here, environmental processes are centered in the lived space since climate change is transforming space, and its uses, at a faster pace than ever before. As we face a radical transformation of the shoreline, space has to be

reproduced according to this transformation, especially with the threats it imposes on actual uses of the shore. The processes guiding the transformations of space and its uses are important to analyze considering the effects they have on tourism. As one of the largest industries of the archipelago, the tourism sector is particularly eager to seize upon shores as a value-laden space for postmodern hedonistic capital, adding high economic and symbolic values to the land.

Tourism is a convenient spatial fix for surplus capital given that second homes and commercial tourist areas add immaterial sets of values, offering a level of appreciation beyond the material value of space. These values are anchored in sets of leisure mobility, thus broadening the potential market for users and buyers, while the presence of this market in a limited space, especially the shoreline, creates a strong value to this fixed capital asset [61,62]. Today, this fixing of capital in coastal space through tourism is disrupted by climate change, as it adds a risk dimension to the process.

The impacts of climate change on the shoreline, particularly accelerated erosion, not only affect the reproduction of space; they also reveal the values at play in a reordering of space and its use. Tourism, with its capacity to generate economic gain in bringing experiential subjectivity to the market [42] in spaces that were left out of previous production systems, is confronted with a concurrent transformation caused by climate disruption which alters physical space, through erosion and submersion in the case of the Magdalen Islands, and symbolically with the element of risk perception. The specific example of La Grave is important to our understanding of the transformation in this regard. The tourist-oriented area of La Grave mobilizes multiple stakeholders to protect the built environment through heritage discourses and also by way of its capacity to accumulate capital through tourism. Tourism activities add a symbolic capital that can be harnessed to access resources so as to ensure that these activities are maintained in time and space, while the heritage value discourses that frame this place as a witness of time are instrumental in reproducing a unique location which is at the same time a small commercial strip with the usual triptych of coffee shops, restaurants, and craft boutiques needed to lure tourist dollars. Investment in beach-replenishing structures is an attempt to protect the spatial fix of capital in the buildings and businesses in place, which are the beneficiaries of this investment, while justifying the importance of the site to multi-tiered government bodies, with supralocal use by tourists serving as a testimony to the larger heritage importance of the site.

While not addressing the positive or negative aspects of choosing climate change adaptation for purposes of beach replenishment, we have pinpointed the different relationalities of space and of capital at play in the justification of such an important physical and economical intervention in space. Our research reveals how, beyond history and security, it is the capacity of tourism flow to foster accumulation in time and space that makes such a weighty intervention possible. This conjunction of discourses and intervention (re)produces space within the capital accumulation regime as well as within transformations of space by climate change. This (re)production of space is transforming conceived space by reordering the spatial hierarchy, while building the very elements of perceived space guiding the future hierarchy of space to be salvaged from climate change, versus space to be abandoned to its ravages. Each time there is such an investment, resources must be allocated; making them available for one space means withholding them from other spaces, other users, and other communities. Therefore, the role of tourism within the capitalist accumulation system is important to our understanding of the production of space as it unfolds within a slow but steady reordering of space and place wrought by a climate change-induced transformation of absolute physical space as well as relative and relational spatial elements therein.

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