



**HAL**  
open science

## Uncertain tourism: Evolution of a French winter sports resort and network dynamics

Yohann Rech, Elodie Paget, Frederic Dimanche

### ► To cite this version:

Yohann Rech, Elodie Paget, Frederic Dimanche. Uncertain tourism: Evolution of a French winter sports resort and network dynamics. *Journal of Destination Marketing & Management*, 2019, 12, pp.95 - 104. 10.1016/j.jdmm.2019.03.003 . hal-03480659

**HAL Id: hal-03480659**

**<https://hal.science/hal-03480659>**

Submitted on 20 Dec 2021

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

**Uncertain tourism:  
Evolution of a French winter sports resort and network dynamics**

Yohann Rech <sup>a</sup>, Elodie Paget <sup>b</sup>, Frederic Dimanche <sup>c</sup>

<sup>a</sup> Univ Rennes, VIPS<sup>2</sup> - EA 4636, F-35000 Rennes, France  
E-mail address: yohann.rech@univ-rennes2.fr

<sup>b</sup> Univ Rennes, VIPS<sup>2</sup> - EA 4636, F-35000 Rennes, France  
E-mail address: elodie.paget@univ-rennes2.fr

<sup>c</sup> Ted Rogers School of Hospitality and Tourism Management, Ryerson University, 350  
Victoria Street, Toronto, Ontario, M5B 2K3, Canada  
E-mail address: fdimanche@ryerson.ca

**Corresponding author: Yohann Rech**

Univ Rennes, VIPS<sup>2</sup> - EA 4636, F-35000 Rennes, France  
Postal address: Campus La Harpe, Avenue Charles Tillon, CS 24 414, 35 044 Rennes Cedex,  
France  
E-mail address: yohann.rech@univ-rennes2.fr

## Uncertain tourism:

### Evolution of a French winter sports resort and network dynamics

#### 1. Introduction

France has an important position in the international winter tourism market. With 51 million skier visits during the winter of 2016-2017 (Vanat, 2018), it ranks second in the world just behind the USA and ahead of Austria. France has 336 winter sports resorts with a total of 3391 lifts (1121 aerial lifts, 2238 ski lifts and 32 other lifts), which represent 18% of the worldwide capacity (STRMTG, 2015). Seven mountain ranges are suitable for skiing, and among them, the Alps (Northern and Southern) have the largest number of lifts. In fact, these two ranges alone account for 204 winter sports resorts. While there were ski resorts before the 1960s, the era of planned development of the mountains began in France in 1964, when a proactive state policy led to the rapid growth of the tourism sector. As Guerin (1984, page number required) explains, “the setting up on August 10, 1964 of an Interdepartmental Mountain Planning Committee to coordinate and guide investments for the creation of winter sports resorts is a fundamental date because it is the realization of an idea: the mountain is a playground.” Many resorts were created thanks to this deliberate tourism policy and the national ‘Snow Plan’ in 1970 accentuated this development. From the 1980s, the creation of new resorts became a rare event and there were instead expansions or connections between existing resorts. In contrast, the lift capacity for transporting skiers was greatly increased and most facilities have been renewed in the past few years.

Mountain tourism represents a very important market in France, with €9 billion of revenues (ATOOUT France, 2015). However, the strong development of the sector up until the beginning of the 2000s has tended to slow and serious difficulties have emerged. Winter tourism (and particularly the skiing market), which was for a long time considered as ‘white gold,’ has experienced important changes. The difficulties are both conjunctural and structural. There are especially large differences among the regions and among the mountain ranges (for example even in the heart of the French Alps, the Northern Alps offer larger and more famous resorts such as Chamonix, Megève, and Les Arcs), but there are also disparities with regard to resort management. In France, the ski resorts can be managed by public bodies, by private operators, or be the result of a public/private partnership. Moreover, an ever-greater dichotomy can be observed between the large and very prosperous resorts, which have a vast

35 ski area at over 2000 m altitude (with glacier skiing) and others, much smaller, located at  
36 lower altitudes with a diminishing clientele. If winter sports resorts are particularly vulnerable  
37 to climate change (Agrawala, 2007; Simpson, Gössling, Scott, Hall, & Gladin, 2008), this is  
38 even more dramatic for those that are located at lower altitudes. As explained by Soboll and  
39 Dingeldey (2012, p.102), “several ski areas, particularly the smaller ones at lower altitudes,  
40 might cease ski operations and switch to snow-independent forms of winter tourism or to  
41 summer tourism instead.” Faced with the current climate evolution and haphazard snowfalls,  
42 these ski resorts experience increasing difficulty to provide services for the whole of the  
43 winter season. As highlighted by Scott, McBoyle, Minogue, and Mills (2006, p.393), “climate  
44 change will create winners and losers in the ski industry of eastern North America.” This  
45 statement is equally valid for Europe as shown by studies in Sweden (Moen & Fredman,  
46 2007), Austria (Wolfsegger, Gössling, & Scott, 2008), or Switzerland (Elsasser & Messerli,  
47 2001). The risks are not concentrated in only one geographical region: they are felt just as  
48 much in North America as in Australia (Morrison & Pickering, 2012) or in the Alps (Elsasser  
49 & Urki, 2002; Koenig & Abegg, 1997).

50 This research project aims to understand how resorts are facing change. The study  
51 focuses on all the conjectural (e.g. climatic risks, economic development, etc.) and structural  
52 (e.g. changes in the management of the resorts, development of the services provided, etc)  
53 changes that produce new forms of organization within the resorts themselves. These can be  
54 analyzed according to Callon et al.’s (2011) study, which explains that there is a significant  
55 difference between risk and uncertainty. In the first case, scientific knowledge is sufficiently  
56 advanced to make well-grounded decisions, while in the second, situations are more complex  
57 because knowledge is not yet well-established. Changes affecting winter sports resorts relate  
58 more to the second case because on the one hand, there is a controversy (or several) with  
59 regard to these changes (e.g. about climate change), while on the other hand, winter tourism  
60 mainly suffers from uncertainty (about the clientele, the economic situation, the snowfall,  
61 etc). Climatic uncertainty particularly illustrates this situation. Some winter seasons can  
62 present numerous episodes of snowfall whereas others can be dry and thus catastrophic from a  
63 winter tourism perspective. The situation is even more complicated because a very snowy  
64 season can also turn out to be disastrous: the weather can be so bad that it deters  
65 holidaymakers from choosing a winter vacation. It is therefore uncertainty that is dominant,  
66 since no model can predict long-term development. For this reason, the definition of an  
67 appropriate tourist policy remains complex and reflects the need to ‘act in an uncertain world’  
68 (Callon et al., 2011). The analysis of the changes proposed by this study therefore allows a

69 shared exploration ‘of possible worlds’ by discussing the suitability of certain political  
70 choices. It is above all a question of understanding how actors are involved in these tourist  
71 controversies and what the terms of the debate are. It is also a matter of comprehending how  
72 these controversies help to create the ‘collectives’, integrating actors into the debate and  
73 mobilizing spokespeople from sports, tourist, environmental, or user associations. From this  
74 perspective, actor-network theory (Callon, 1986; Latour, 2005; Law, 1994) is particularly  
75 relevant as it captures new forms of organization and ‘collectives’ that are created due to the  
76 new developments that affect resorts.

77

78

## 79 **2. Actor-network theory and tourist uncertainties**

80

### 81 2.1. Actor-network theory as a background

82

83 This study adopts a social constructivist approach with actor-network theory (ANT)  
84 serving as the foundation to understand how the actors adapt to the changes that take place in  
85 ski resorts and how they manage nature. The aim of ANT is to show how technical or  
86 scientific innovations are made possible because of the association of human and non-human  
87 entities, which together can form a socio-technical network (Akrich, Callon, & Latour, 2002;  
88 Latour, 1987, 1996). This sociological approach deals with the society being formed and tries  
89 to understand how ‘collectives,’ uniting various entities, are produced. It thus rejects the  
90 sociologizing conceptions that explain social facts by other invisible social dimensions.  
91 Collective action is composed of individuals but also of objects that classical sociology leaves  
92 aside. The socio-technical networks being formed, which bring the innovations (or which are  
93 at the core of important controversies), have therefore this particular quality: they are hybrids  
94 that are composed of humans and non-human entities. One of the specificities of the actor-  
95 network theory is thus to transcend the classical dichotomies upheld by the social sciences,  
96 not only between the technical and the social, but equally between the individual and the  
97 group, the micro-logical and the macro-logical, and even more between the social and nature.

98 The epistemological position of this approach rests on four principles (Law, 1994).  
99 The first is the ‘principle of symmetry’ (Callon, 1986). This does not mean egalitarianism  
100 between humans and non-humans, but simply that the researcher should not “impose a priori  
101 some spurious ‘asymmetry’ among human intentional action and a material world of causal  
102 relations” (Latour, 2005, p.76). While the modern world has created a great division between

103 humans and non-humans, it is, in contrast, a matter of reconsidering all entities that transform  
104 the action. In fact, non-human entities have a capacity to perform the social, that is, to  
105 transform it and recompose the relations among the actors. The second principle is that of  
106 'reflexivity'. It is fundamental in ANT as it is a strongly epistemological position. Law (1994)  
107 refuses to think that sociologists are observing the actors they are studying from afar. In fact,  
108 even if the concepts used are different and the professional aspirations are divergent in terms  
109 of purpose, all are participating together in the same movement. However, it is not a question  
110 of objectivizing the actors' words but rather of following them in their explanations and their  
111 activities (Latour, 1993). The actors are credited with the ability to explain their actions and to  
112 have true self-reflexive activity on their actions. The position that sociologists hold in their  
113 field of study is therefore redefined. It is a question of rethinking authority and no longer  
114 establishing an asymmetry between the experts (the scientists) and the uninitiated (the actors).  
115 The third principle is that of 'non-reductionism'. This concludes that the social cannot be  
116 reduced to *a priori* categories. The approach is therefore close to ethnomethodology  
117 (Garfinkel, 1967) and this precept of 'non-reductionism' can only be applied if one begins to  
118 describe before explaining, by telling 'in-depth stories' (Law, 1994). Finally, the fourth  
119 principle is that of 'recursiveness'. This is a matter of considering the social in its dynamics  
120 and its instability. The social realm moves and is in perpetual transformation. Society is not  
121 stable but uncertain and it is precisely this dimension that seems to be the most relevant to  
122 understand contemporary mutations.

123 While actor-network theory has unquestionably contributed heuristically to sociology  
124 and therefore to the understanding of social reality, it has also been the subject of much  
125 criticism and is relatively divisive in the field of social sciences. Like any theoretical  
126 approach, it presents limits that must be acknowledged. Several critiques have addressed  
127 ANT, particularly in the field of science studies (Bloor, 1999). Such critiques particularly  
128 concern the limits of symmetrical anthropology (Chateauraynaud, 1991; Grossetti, 2007) and  
129 the metaphorical dimension of networks (Dubois, 2007). The controversies surrounding ANT  
130 are numerous and need to be integrated to avoid any dogmatic use of this approach.

131

## 132 2.2. ANT and tourism

133

134 Actor-network theory has already formed the basis for various tourism studies (e.g.,  
135 Dedek, 2017; Franklin, 2004; Johannesson, 2005; Jørgensen, 2017; Paget, Dimanche, &  
136 Mounet, 2010; Ren, Pritchard, & Morgan, 2009; Ren, 2011; Rodger, Moore, & Newsome,

137 2009; Tribe, 2010; Van der Duim, 2007). It can be considered a new field of research in  
138 tourism (Cohen & Cohen, 2012). However, in spite of this trend for research on tourism from  
139 the ANT perspective, there is a certain fragmentation in the field of these studies. They are, in  
140 fact, very diverse in terms of the objects of study and they vary from empirical to theoretical  
141 (or even epistemological) considerations, and from case studies to more general analyses. The  
142 main interest of ANT is to be able to comprehend tourism in its dynamic state, while at the  
143 same time investigating it at multiple levels, going beyond the classical borderline between  
144 local and global. It is also a way of understanding the phenomenon of generalized mobility  
145 which tourism represents. According to Urry (2005, p.189), “this mobility is produced by  
146 hybrids, flowing along ‘scapes.’ These networks include ‘physical’ and ‘human’ entities,  
147 whose power derives from their complex and fluid association.” Therefore, ANT allows for  
148 the understanding of the tourist phenomenon that is in fact a hybrid network of actors and  
149 things. Objects fully participate in the creation of the tourism site and this materiality  
150 performs the tourism site as much as the tourists themselves (Johannesson, 2005; Ren, 2011).  
151 For Van der Duim (2005, p.86), “a concern with materiality in tourism is a concern with cars  
152 and planes; restaurants, campsites and hotels and their supplies; and natural objects like seas,  
153 beaches, hills and lakes and their related flora and fauna.” ANT also allows the researcher to  
154 produce a territorial diagnosis of tourist destinations, by including how translation processes  
155 (Callon, 1986) are accomplished. It is, for example, what Arnaboldi and Spiller (2011)  
156 propose in the study of cultural districts, explaining that the collaboration among actors is  
157 possible when three stages are in place: enrolling actors, fact-building, and circulating  
158 translations. In the same vein, Paget et al. (2010) have shown how a ski resort can be  
159 considered to be a hybrid network and how a tourism innovation can be imposed when a  
160 translator (in this case an entrepreneur) commits himself to making it work and manages to  
161 mobilize a *collective* around his project.

162

### 163 2.3. Winter sports resorts as an uncertain world

164

165 The conceptual framework of this research is based on ANT. However, it is difficult to  
166 consider this theoretical approach in its entirety, without bearing in mind the changes it has  
167 experienced over the past 30 years. The weakness of the tourism studies that have mobilized  
168 ANT is perhaps to have been mainly inspired by the sociology of translation, without taking  
169 into account recent theoretical developments (Rech & Paget, 2017). By starting from a  
170 common foundation of the ANT concepts, the specificity of the present research is to mobilize

171 the traditional approaches to ANT (Callon, 1986; Latour, 1987) while also provoking  
172 reflection using more recent theories which constitute developments in this approach. Indeed,  
173 the latter, addressed in *Politics of nature* by Latour (2004) as well as in *Acting in an uncertain*  
174 *world* by Callon, Lascoumes, and Barthe (2011), offer a particularly relevant framework for  
175 studying tourism sites. They help to better understand the dynamics of change that can occur  
176 and the strategies of resistance faced to certain developments, as well as the hybrid forms that  
177 emerge and generate controversies restructuring the social. This perspective, in fact, allows  
178 controversies to be researched that are of importance in the tourism sector and have, to date,  
179 been the subject of little research.

180 In order to analyze the current developments in winter sports resorts, this research  
181 project was based on three propositions from Latour (2004). The first is to discover how many  
182 humans and non-humans make up the socio-technical network, called the 'collective'. Thus, it  
183 is necessary to find the number of entities that participate in the collective action. Latour  
184 (2004) calls this the *power to take into account*. It aims to identify entities that can integrate  
185 debates but also clarify the terms of the debate. The second proposition is to know whether  
186 humans and non-humans can live together in a collective. Latour calls this the *power to put in*  
187 *order*. It is a question of understanding, on the one hand, how the common problems are  
188 ranked and, on the other hand, how they are institutionalized and formalized. Lastly, the third  
189 proposition concerns the exploration of common worlds: the way in which a new governing  
190 system is installed. Following this, Callon et al. (2011) have shown how technological and  
191 scientific developments do not always create certainty with regard to future situations. Public  
192 policies are made in emergency situations where all the information cannot be cross-  
193 referenced and above all, they are often written without established scientific knowledge.  
194 According to this, we can state that lower altitude ski resorts, faced with the serious  
195 consequences of change (e.g. climate evolution, customer volatility, international competition,  
196 quick transformations in sports practice) are in situations of uncertainty that render  
197 management very complex. Tourism policies should adapt to unexpected situations and try to  
198 respond to different problems and questions: Will lower altitude ski resorts continue to  
199 receive snowfall in the long term? Should they invest in new lift equipment without a clear  
200 view of the future? Should public investments be chosen in spite of the financial difficulties of  
201 the local authorities or should they find private investors? How can they diversify resort  
202 supply without knowing precisely how demand will evolve? It is however not possible to  
203 have clear answers to those questions at the moment.

204



205 **3. Methodology**

206

207 3.1. Presentation of the field investigation

208

209 The field investigation for this research took place in the Natural Regional Park of  
210 Chartreuse (see Figure 1) in the Northern French Alps. This is a case study (Miles &  
211 Huberman, 1994) and is conducted at two levels. The first is very local as it is the study of a  
212 former winter sports resort, the *col du Coq*. This resort stopped operating in 1995 but the ski  
213 lifts are still in place, although unused. It was a ‘micro ski resort’ like many in France,  
214 composed of some ski lifts and located at about 1400 m altitude. The site is therefore marked  
215 by its tourism past and over the last few years has become a brownfield site. Despite the fact  
216 that the resort is no longer active, it is still very popular, especially for winter sports activities  
217 (snowshoeing, ski touring, sledding, etc). The site has no buildings to offer on-site  
218 accommodations to tourists. Tourist accommodations are therefore not at the resort but below  
219 it in the nearby villages. The second level of analysis is at a more territorial level and explores  
220 the links between this former winter sports resort and the neighboring resorts on the same  
221 mountain range. These winter sports resorts are also small in size but continue to function,  
222 even though they are located at a lower altitude (900 m) and are experiencing serious  
223 difficulties. These are the *Saint-Hilaire*, *Saint-Bernard*, and *Saint-Pierre de Chartreuse*  
224 resorts which belong to the territory of the *Plateau des Petites Roches* (PPR).

225

226 [Please insert Figure 1 about here]

227

228 The field investigation site was chosen on the one hand because it corresponded to the  
229 researchers’ desire to investigate a tourist controversy by studying a winter sports resort. The  
230 *col du Coq* resort matches this because it has been closed and has been the subject of local  
231 debates about the future of the site. Indeed, the *col du Coq* site is very busy in winter and has  
232 better snow conditions than other ski resorts at lower altitudes. As a result, the question of its  
233 tourist future arose as well as that of its commercial exploitation. On the other hand, the  
234 Natural Regional Park of Chartreuse funded the study. The choice of the field study was made  
235 in agreement with the scientific director of the Park as well as the manager of outdoor  
236 recreation, in order to respond to their concerns. Therefore, the analysis of the controversy can  
237 be conceived as a decision-making aid, since the Natural Regional Park of Chartreuse had to

238 make important political choices to define a future for this site, while at the same time  
239 defining a global strategy for the other ski resorts in the territory.

240

### 241 3.2. Qualitative research

242

243 The research project was carried out using a comprehensive (Weber, 1978) and  
244 inductive (Glaser et Strauss, 1968) approach. Taking a qualitative perspective (Hollinshead,  
245 2006; Jamal & Hollinshead, 2001; Pernecky & Jamal, 2012; Phillimore & Goodson, 2004;  
246 Riley & Love, 2000; Walle, 1997; Westwood, Morgan, & Pritchard, 2006), the empirical  
247 material collected rests on different methods of investigation, where data triangulation sought  
248 to guarantee the reliability of results and allow for an objective analysis (Decrop, 1999;  
249 Thietart, 2001; Yin, 2003). A multi-method approach was thus used, consisting of personal  
250 interviews (with two different target publics: the site actors and the users), documentary  
251 analysis, and observation.

252 The study sample was composed of 25 site actors. An interview guideline was prepared in  
253 advance according to several dimensions related to the problem and semi-structured  
254 interviews were conducted. Specifically, the actors (concerned by the site or by the former  
255 resort) were asked about:

256

- 257 • Their respective roles, their objectives, their strategies and their (conflictive or  
258 cooperative) relations with the other actors;
- 259 • The site and the different practice areas, the sports facilities and products;
- 260 • The involvement of the actor in the tourist controversy concerning the future of the  
261 resort and its representation of the management mode that should be chosen (e.g.  
262 tourism management, environmental management);
- 263 • The representation of changes and existing problems (e.g. climate,  
264 accommodation, high usage rates);
- 265 • Tourist and leisure policies, and choices concerning the future of the low altitude  
266 resorts.

267

268 The choice of relevant stakeholders was made according to the methodological  
269 precepts of ANT, by following the actors and the controversy. The relevant actors who could  
270 represent an organization (or an authority) were interviewed, whether independent actors or

271 elected representatives. First, the actors were chosen who directly or indirectly structured the  
272 context of the action, and this list of actors was later extended as the study progressed. The  
273 number of actors is limited by the small size of the tourist site. Most of the relevant actors  
274 were interviewed. As a result, the researchers met the protected area managers, the municipal  
275 and inter-municipal elected officials, the staff of tourist offices, a host, the sports service  
276 providers, the sports and leisure associations, an association of environmental protection and a  
277 farmer (see Table 1).

278

279

[Please insert table 1 about here]

280

281 To complement the interviews carried out with the site actors, a series of interviews  
282 was also conducted with the site users. Consideration of the demand is a factor to take into  
283 account because, as Frochot and Kreziak (2008) pointed out, non-ski snow activities have  
284 been the subject of significant development by resorts. The case of the *col du Coq* resort is  
285 interesting because the ski lifts are unused, but the site is very popular and the practitioners  
286 come necessarily for activities other than alpine skiing. These interviews were thus important  
287 to understand the site users' points of view in the face of the plans for the resort and their  
288 position in the controversy. A total of 24 four interviews were conducted during the winter  
289 season with the people who used the *col du Coq* area for recreational activities. These  
290 interviews were midway between semi-structured and comprehensive interviews (Mucchielli,  
291 1996). They were carried out face-to-face on site, after subjects had finished their activities. In  
292 order to have different profiles for those practicing the activities, the survey area on the site  
293 was varied, as were the days on which the interviews took place (i.e. weekdays, weekends,  
294 holidays), the time (i.e. morning, midday, evening) and the weather conditions (i.e. good  
295 weather, cloudy weather, mist, and snow). A specific interview guide was created. The  
296 dimensions of this guide dealt with: (1) the use of the *col du Coq* site (in terms of activities,  
297 routes, frequency of attendance, and activity modalities), (2) the interviewee's perceptions of  
298 the site (knowledge of the site with regard to the area and the environment), (3) the  
299 development of the site and its 'tourist' future (notably the question of the re-launching of the  
300 winter sports resort), and (4) perceptions about site management. The interviewees could also  
301 address other topics in the discussion. These elements were to help understand their  
302 perception of the controversy and their level of involvement.

303 In addition, many documents were identified and analyzed, such as agreements  
304 between actors, leases, cadastral maps, tourist brochures, cartographic data, management

305 plans, local municipal ordinances, and minutes of meetings. All these elements are the many  
306 traces of the social that enable to reconstruct the associations of actors (Latour, 2005) and to  
307 trace their links.

308 Finally, observations were carried out on site. They allowed for a detailed study of the  
309 different activity areas in order to ask the actors the most relevant and precise questions  
310 possible. Observations were also made of the people practicing sports in order to comprehend  
311 the different ways in which the site is used. Ethnographic surveys were carried out using a  
312 research blog, where all relevant information for analysis was recorded.

313

### 314 3.3. Data analysis

315

316 All interviews were recorded with the agreement of the interviewees. They were  
317 transcribed in their entirety and then analyzed using a content analysis grid (Bardin, 2007).  
318 This analysis grid was composed of the topics of the interview guide that was related to the  
319 central thesis, and that was completed with new dimensions that appeared in the interviews.  
320 Finally, these topics were also developed during the analysis itself because following a  
321 controversy (Latour, 2005) is useful to integrate elements of discourse and arguments that  
322 may be important and were not previously considered. Moreover, the data analysis requires  
323 the production of a somewhat random report (Latour, 2005). It means considering the  
324 researcher as an integral part of the research context (and not as an individual looking down  
325 on what he or she is studying). The study resulted in a research report that presented the issues  
326 around the controversy and that served as a decision-making tool for those who manage the  
327 site.

328

329

## 330 **4. Results: Description and analysis of a tourism controversy**

331

332 The analysis of socio-technical controversies is an excellent means of exploring the  
333 stakeholders, redefining the problems and describing the role of the protagonists (Callon et  
334 al., 2011). To follow the actors in the controversy is to understand how their relations and  
335 their organization are transformed. The changes that affect low-altitude resorts produce  
336 organizational transformations and the ANT allows us to better understand them. First, the  
337 origins of the tourist controversy and the role of the actors will be described, An in-depth  
338 analysis of the arguments that are developed will then be undertaken. Finally, the analysis will

339 focus on three essential elements that contribute to redefining the relationships between  
340 actors: the snow as non-human and unpredictable, the changes in supply and accommodation  
341 needs, and finally the way to promote the site.

342

#### 343 4.1. Tourism actors in the controversy

344

345 This first part of the results refers to the *power to take into account* (Latour, 2004) and  
346 thus to the census of the actors involved in the controversy to understand their degree of  
347 involvement. The first task of collecting the entities involved in the action is not carried out *a*  
348 *priori* but is the result of the interviewing work by following the actors and the controversy.  
349 This is important as it allows a better understanding of how the controversy, through different  
350 stages, helps to redefine relations and the tourism network. The development of the *col du*  
351 *Coq* resort presents different aspects of a controversy, which can be qualified as ‘touristic’ in  
352 the sense that the site’s future remains unresolved and that each actor deploys particular  
353 arguments concerning this uncertainty.

354 It is necessary first to explain the object of discord and to go back to the beginning of  
355 the controversy. While the organization of the different activities at the *col du Coq* raises  
356 various problems, the question of the re-opening of the ski lifts is a central point. In fact, the  
357 *col du Coq* resort has been closed since 1995 and it has gradually become a brownfield site.  
358 However, after some years, the resort has begun to experience renewed interest from local  
359 stakeholders, despite the advent of climate change. The project to re-launch the resort has  
360 provoked an important debate at the local level. The discord is not just about re-launching the  
361 resort: it takes different forms that oppose in a complex way those in favor and those against  
362 the resort. There is a whole range of positions that can be observed and which can, at times,  
363 be seen changing. The controversy has taken a socio-technical dimension in the sense that it  
364 involves a variety of actors (managers, elected representatives, sport providers, hosts,  
365 environmentalists, etc) around the various physical elements: re-appropriation of a touristic  
366 area, development of the site, dismantlement or re-launching of the ski lifts, whether or not to  
367 clear snow from the roads, climate change and sustainability of resorts at lower altitudes,  
368 environmental uncertainty on the impact of outdoor activities, creation of car parks and the  
369 resulting consequences in terms of attendance.

370 Four types of actors are involved in the development of tourist activities at the *col du*  
371 *Coq*. First the elected officials who revolve around *Saint-Pierre de Chartreuse*, who are  
372 responsible for the tourist area but do not want to develop alpine skiing facilities. Second, the

373 ecologists, the technicians of protected areas, as well as some lower altitude mountain guides,  
374 who do not want the mountain to be developed and advocate the dismantlement of the  
375 abandoned pylons. Third, the tourism stakeholders on the territory of the PPR, who are  
376 mobilizing to re-launch the *col du Coq* ski resort. Fourth, the elected officials of the PPR, who  
377 wish to develop their own small winter sports resort, and to give up on the *col du Coq*, against  
378 the advice of tourism stakeholders. All these actors are inter-related around the same common  
379 problem: how to use the *col du Coq* tourist area. However, the approach in terms of ‘local  
380 order’ (Friedberg, 1996) only provides a partial reading of the situation as in reality, this  
381 common ‘spatialized’ problem contains multiple problems referring to action contexts that are  
382 distributed all over the *Chartreuse* territory. The controversy has a very complex spatial  
383 dimension that should be addressed in terms of networks. The action context of the *col du*  
384 *Coq* can only be understood by tackling the situation of the other local winter sports resorts.  
385 ANT is therefore particularly relevant in this analysis because, as Latour (2005, p.200)  
386 explains, “what is acting at the same moment in any place is coming from many other places,  
387 many distant materials, and many faraway actors.” Moreover, each group of actors brings a  
388 different answer to the general question, wanting to introduce entities into the collective that  
389 others do not want (ski lifts, development of commercial buildings, roads, etc).

390

#### 391 4.2. The arguments mobilized in controversy

392

393 Before addressing the complexity of the controversy, it is important to summarize the  
394 different arguments that the various opponents have deployed to justify their positions in the  
395 controversy (see Figure 2).

396 **First argument: Abandonment of the project to re-launch the ski resort.** The  
397 elected officials from the territory of the PPR and from the heart of the *Chartreuse* range are  
398 almost unanimous, in spite of the tensions among them, in that the *col du Coq* resort should  
399 not be re-launched. For the elected officials of the middle of the *Chartreuse* Park, apart from  
400 economic reasons, environmental arguments are put forward against bringing the ski lifts back  
401 into service: “it doesn’t interest us, not because that competes with us here, but simply  
402 because it is a unique site; it is a site which should be protected; it is a site which would cost  
403 an enormous amount of money and we know it” [elected public official from *Saint-Pierre de*  
404 *Chartreuse*]. The villages at the heart of the *Chartreuse* region have no particular ambition to  
405 develop alpine skiing on this site. Regarding the PPR, the justification used by the elected  
406 representatives mainly focuses on economic arguments and on the general interest that is to

407 encourage the development of the PPR territory: “These were the conclusions of the work in  
408 the [Natural Regional] Park where we all worked together, we were all working on it,  
409 especially *Saint-Bernard* and *Saint-Hilaire* and as it was seen that our resorts were operating,  
410 we could see that we didn’t have the means to have a third. In any case, it was the money that  
411 was the sinews of war” [elected representative of *Saint-Hilaire*]. The elected officials justify  
412 their preference for not investing in the *col du Coq* by also focusing on the difficult territorial  
413 network of the *col du Coq*: “*Saint-Pierre de Chartreuse* didn’t play the game; well that’s true.  
414 On the other hand, I understood the mayor at that moment who already had a lot of difficulties  
415 with his resort and didn’t want to weigh himself down because it was his responsibility, the  
416 *col du Coq* is *Saint-Pierre de Chartreuse*’s responsibility; we shouldn’t forget that either”  
417 [elected representative of *Saint-Hilaire*].

418         **Second argument: Dismantlement of the resort.** This argument suggests that the site  
419 of the resort is problematic because it is the interface among several protected areas. All the  
420 various managers of these areas share the desire to not re-launch winter tourism activities that  
421 would require significant development of facilities. Therefore, an environmental and reasoned  
422 management is more recommended. For these actors, a tourism site is incompatible with a  
423 protected area (which possesses significant regulatory prerogatives). As one of the managers  
424 said, “political choices had to be made” [environmental manager of departmental council],  
425 either by developing winter tourism, or by creating protected areas. Furthermore, the  
426 managers also put forward the idea that the development of the resort contradicts the spirit of  
427 the charter of the Natural Regional Park. Some outdoor recreational activity providers such as  
428 lower-altitude mountain guides are proponents of these types of arguments and some even  
429 advocate, similar to environmental militants, the dismantlement of the old ski lifts: “I think  
430 we need action from ‘Mountain Wilderness’ [an NGO] to dismantle all the pylons if things  
431 stay the same” [mountain guide]. Another outdoor recreation provider said almost the same  
432 thing: “I am for the dismantlement and the return of the *col du Coq* terrain to what it was like  
433 when I was a boy. It’s no longer any good for anything” [mountain guide]. The arguments  
434 mobilized by users with regard to the future of the site and the problem of the ‘de-  
435 touristification’ of the area are the same. Some talk about the place in terms of a tourism  
436 brownfield site and advocate the dismantlement of the pylons. The impact on the landscape of  
437 the old abandoned resort is highlighted. These are individuals who sometimes clearly perceive  
438 the impact of climate change on the lower-altitude resorts and are radically opposed to  
439 artificial snow.

440           **Third argument: Development of Nordic skiing.** The development of this activity is  
441 often mentioned. A significant number of cross-country skiers leave from the *col du Coq*  
442 resort to ski to other Nordic skiing sites. Some cross-country skiing trails are only 100 m  
443 away from the old station of the *col du Coq*. Among the various developments under study to  
444 develop the *col du Coq*, snowshoeing and Nordic skiing are considered as a means of  
445 development: “There is a forest road that will start, which could be used in winter for Nordic  
446 skiing and the snowshoe, which would allow an easier junction of the *col du Coq* and the *col*  
447 *de Porte* than at present” [elected representative from local council community]. The elected  
448 officials put forward the idea that there should be a common tax for the different resorts and  
449 above all the possibility of marketing a more extensive product. The development of the  
450 mountain through Nordic activities is thus perceived as a means of developing a soft and  
451 alternative tourism: less harmful and expensive than the development of a ski resort.

452           **Fourth argument: Snow clearing from the road.** Clearing snow from the road is  
453 another point of dissension. During the winter of 2008, the road to the *col du Coq* had been  
454 cleared less frequently than in previous winters (no scattering of salt, irregular clearance of  
455 snow, etc). This is very important as it impacts the number of visitors and the type of people  
456 who come to the site. The people who are opposed to snow clearing either have  
457 environmental motives (salt reduction) or are pleased with the fact that it ‘naturally’ regulates  
458 the number of visitors. Political decisions have been taken to lessen road clearance in winter:  
459 “As the *col du Coq* is closed, there is no activity anymore, at one time we asked to stop  
460 salting, after the houses” [elected representative from *Saint-Pancrasse*]. This type of decision  
461 has of course a limiting effect on the frequentation of this space. On the other hand, some  
462 actors wish the road to be cleared to allow the development of the site and the activities. “At  
463 the level of the activity it raises a problem in the sense that if there is a lot of snow, I can not  
464 take my clients up there [...], snow clearing is problematic for me at the level of my activity”  
465 [Hiking provider].

466           **Fifth argument: Re-launch of the resort.** Finally, another group of actors (hosts,  
467 etc.) declare that they are for the re-launch of tourist activities in the *col du Coq*. One of the  
468 main arguments is the complementary nature of the PPR resorts and above all the prospect of  
469 guaranteeing snow. Indeed, because the *col du Coq* resort faces north it is seen as a way to  
470 alleviate the snowfall problems. For them, the site has a higher degree of snowfall than the  
471 two resorts of the PPR. Thus, if it were re-launched it would allow tourism to be maintained:  
472 “20 or 30 years ago, we could say that there is no snow at *Saint-Hilaire* but that isn’t a  
473 problem because there is snow at the *col du Coq*. We could guarantee it, and people came. If



474 there was snow and a ski school, there were no problems and people came” [holiday cottage  
475 owner]. The arguments put forward also reflect individual interests as the tourist development  
476 of the *col du Coq* would be a way to ensure year-round economic activity whereas at the  
477 moment, it is very uncertain. Furthermore, the re-launching of the resort is mentioned by  
478 some sports people (mostly locals) who would like to have a rope-tow for children instead of  
479 the re-opening of the ski lifts.

480

481 [Please insert figure 2 about here]

482

### 483 4.3. Snow, an unpredictable, non-human entity

484

485 Snow is a non-human entity that produces uncertainty in winter sports tourism. In fact,  
486 scientists have stabilized their knowledge on global warming (Latour, 2015) and the elected  
487 representatives of the tourist municipalities have to make decisions regarding the development  
488 of the mountain for tourism purposes. Thus, an elected representative from the PPR  
489 commented on the new tourist policy in this French department (a territorial administrative  
490 unit): “The department does not want to reinvest in the resorts, it’s over. The resorts at lower  
491 altitude with climate change, I don’t know if they will last, if they are a tangible reality. But  
492 elected officials do not want to invest in the resorts” [elected representative from *Saint-*  
493 *Pancrasse*]. This is at the heart of the problem of acting in an uncertain world as described by  
494 Callon et al. (2011). The organizational uncertainty that results from random snowfalls at  
495 lower altitude does not come from the actors but from things. Without snow, snow-based  
496 tourism no longer exists. As one policy-maker explains: “We cannot attract so many people in  
497 winter if there is no snow. So in my opinion the problem is still pending. We can do lots of  
498 things; it’s true we can diversify, people no longer come just for the snow, just to ski, [...] but  
499 with no snow they don’t come at all” [elected representative from local council community].  
500 The presence of snow makes winter tourism possible but does not eliminate uncertainty. On  
501 the one hand, the period when it snows has to coincide with the high season in the resorts  
502 (which in France corresponds to the Christmas holidays and the school holidays in February).  
503 On the other hand, the presence of snow is impossible for the actors of tourism to anticipate:  
504 “The people who call from all over France to ski, the first thing they say is: ‘Is there snow?’ I  
505 always tell them I rent you the facilities, the chalet, I order snow but I can’t promise it. I can’t  
506 put it in black on white” [holiday cottage owner]. This uncertainty is therefore particularly

507 complex to manage for the tourism stakeholders because it is difficult to guarantee product  
508 quality.

509         The role of snow is central because it produces connections among the sites. Thus, it is  
510 impossible to understand the actions and the strategic issues that actors and politicians face  
511 regarding the re-launching of the *col du Coq* resort, without looking at the other resorts in the  
512 *Chartreuse* range. There are different attachments that are created between the particular areas  
513 and sites (and thus between the actors). For example, the elected officials from *Saint-Pierre*  
514 *de Chartreuse* do not want to develop the *col du Coq* for alpine skiing not because they no  
515 longer believe in winter tourism but because they have other ambitions, such as re-  
516 appropriating another small resort that is more accessible for them. The stagnation of the re-  
517 launching of the *col du Coq* is above all the result of a political choice. When tourism policy  
518 was redefined and a choice had to be made among the three micro-resorts of the PPR, the  
519 resorts of *Saint-Hilaire* and *Saint-Bernard* were preferred to the detriment of *col du Coq*,  
520 despite the opinion of the tourism service providers. This choice is explained in particular by  
521 a disagreement among the mayors of the various municipalities and by the difficulty to set up  
522 a tourism policy at the inter-municipality level. In short, the case of the *col du Coq* can only  
523 be understood if the core of the problem is shifted towards the other tourism sites in  
524 *Chartreuse* and if we retrace all the network connections.

525         Finally, the place given to snow in the network is different for each group of actors.  
526 For some of them, snow does not have to define the ‘collective’ and an alternative form of  
527 tourism has to be invented (this is the case, for example, of the ecologists, or some technicians  
528 of protected areas). For others, snow should totally define the ‘collective’ and there can be no  
529 tourism unless it is winter tourism. But there again, the actors disagree. Some consider that  
530 the ‘natural’ snow at the *col du Coq* should be exploited while others would like to try and  
531 produce ‘artificial’ snow at a lower altitude: for example, at the *Saint-Hilaire* and *Saint-*  
532 *Bernard* sites.

533

#### 534 4.4. Reconfiguration of the accommodations and changes in tourist demand

535

536 Among the various changes that affect lower-altitude resorts, the transformation of tourist  
537 accommodation supply and the evolution of tourism demand are two phenomena that are  
538 closely linked and that are particularly de-structuring for mountain territories. The *col du Coq*  
539 does not rely on on-site tourist accommodations. However, these transformations are often at  
540 the heart of the debate between the proponents of greater development for the *col du Coq* and

541 the defenders of alternative tourism. In fact, the evolution of tourists' tastes and the re-  
542 structuring of the local accommodation supply are elements that are taken into account by the  
543 actors. In contrast, the potential solutions to address these changes differ from one actor to  
544 another.

545         The PPR territory has a relatively important tourism past thanks to the role played by  
546 its two winter sports resorts and the development of hang-gliding and paragliding since the  
547 1980s. However, the distribution of tourist beds has been geographically unequal. The  
548 municipality of *Saint-Pancrasse*, which is nearer to the *col du Coq*, has never had tourist  
549 accommodations, even at the time when the old resort was working: "there are a few holiday  
550 cottages, there isn't much. *Saint-Pancrasse* is really a very small village" [elected  
551 representative of *Saint-Pancrasse*]. In contrast, the municipalities of *Saint-Hilaire* and *Saint-*  
552 *Bernard* have tourist accommodations that are mainly composed of holiday cottages. The  
553 golden age of lower-altitude winter tourism seems now a bygone era and the actors  
554 unanimously accept that there has been a great reduction in the number of beds available for  
555 tourists over the past few years: "there is a lot of real estate pressure on the PPR and in the  
556 majority of the rural cottages which had been bought some 30 years ago, people have realized  
557 their capital or have retired, and thus have sold the rural cottage which has become someone's  
558 main place of residence and no longer offers tourist accommodation" [elected representative  
559 *Saint-Hilaire*]. In 15 years, the number of beds available for tourists in the three  
560 municipalities dropped from 900 to about 500. The municipalities try to contain this crisis by  
561 finding solutions: "we try to keep the cottages we have, especially the communal cottages.  
562 We keep them, we try to help people who want to invest in cottages as much as possible, but  
563 knowing that our new clientele are customers from Grésivaudan [a valley situated below the  
564 PPR], therefore daily, weekend and holiday visitors" [elected representative from *Saint-*  
565 *Bernard*]. This is in fact a fundamental transformation that is taking place because the main  
566 problem is the shift from winter tourists (who are profitable) to excursionists for outdoor  
567 recreational activities (that are not profitable). Also, the difficult adaptation of the actors faced  
568 with the evolution of tourists' tastes is revealed in a tourist accommodation crisis, which has  
569 not kept up with demand and trends: "I've made some accommodation units in my house,  
570 which at one time corresponded to demand. Now it's more difficult because now [tourists]  
571 prefer an individual chalet, with every comfort inside, everything new, and so as to my units  
572 at home, I have great difficulty in renting them" [holiday cottage renter]. Some socio-cultural  
573 changes reveal an individualization of tourist practices and tourists' search for independence,  
574 which are out of sync with the current type of accommodation offered. This is not just with

575 reference to the PPR as the center of the *Chartreuse* is also affected, even if its  
576 accommodation supply is focused on hotels: “With respect to *Saint-Pierre de Chartreuse*,  
577 [...] a tourist accommodation inventory has recently been conducted [...] and now we have  
578 150 beds at most in the hotels. So, it’s terrible. Now there are four or five establishments left  
579 when fifteen years ago there were eleven of us. It’s dreadful” [elected representative of *Saint-*  
580 *Pierre de Chartreuse*]. The different resorts in the *Chartreuse* are therefore confronted with  
581 an accommodations restructuring which is taking two forms: on the one hand, a real-estate  
582 explosion that is favoring primary (and secondary) places of residence to the detriment of  
583 tourist accommodations; on the other hand, an aging supply of accommodation facilities (i.e.  
584 cottages on the PPR territory and hotels in *Saint-Pierre de Chartreuse*) that is not responding  
585 to the needs of an evolving clientele.

586         However, these difficulties are also related to another factor: the shortening of the  
587 winter season and the random snowfalls that mean that winter sports activities cannot be  
588 guaranteed anymore. As one of the actors explains: “If we want owners to rent  
589 accommodations for tourists, they must be able to rent both in winter and summer, otherwise,  
590 if they can only rent in the summer, they would rather rent the cottage for the whole year  
591 because there is a large demand for yearly rents, it’s much simpler and more profitable”  
592 [association of friends of the *col du Coq* resort]. The tendency that has been observed is  
593 therefore a restructuring of tourist accommodation, which is itself not only a change but also  
594 the consequence of other changes.

595

#### 596 4.5. The issue of tourism promotion

597

598         The issue of promoting tourism goes back to the way in which the ‘captation’ of sports  
599 and tourist publics is organized (Cochoy, 2007). It is therefore necessary to understand the  
600 connections among the actors involved in the promotion of the mountain range and to trace a  
601 network of inter-relations, which seems to be more about conflict than about cooperation. The  
602 organization of tourism promotion for the PPR is difficult. While the tourism office is  
603 responsible for implementing tourism policies, which are defined by the elected  
604 representatives, the exact opposite can be observed. The tourism office has completely  
605 redefined the rules by tinkering with the local legal context and redefining the terms of the  
606 tourism policy. By creating a sports and tourism event with an international scope (the Icarus  
607 Cup, a paragliding event), it has legitimated at the local level its ability to define the events  
608 and/or developments necessary for promoting tourism on the PPR, and it has enrolled a

609 multitude of organizations by granting them a share of the event revenues. Above all,  
610 however, it has become financially independent from the public authorities thanks to this  
611 event. The tourism office also controls the promotion of the mountain range at the territorial  
612 level as it manages the Tourism Development Association (ADT). Thanks to this role, it has  
613 managed to create attachments with the tourism suppliers in the PPR territory and to link the  
614 different contexts of action in the *Chartreuse* region. But this hegemonic position generates  
615 particularly conflictive relationships with the local elected representatives. The tourism office  
616 thus partly controls the summer tourism activities (because of its grip on paragliding) but is  
617 not able, however, to define the terms of the winter tourism policy. Its action is therefore  
618 disputed by the elected representatives but remains an ‘obligatory point of passage’ (Callon,  
619 1986) in the organization of territorial promotion.

620

## 621 **5. Conclusions**

622

623 The aim of this research has been to show how a tourist area can be transformed by  
624 various changes, especially climatic, and to provide a fine description of a tourist controversy  
625 by following the actors, their arguments, and organizational changes. What we call ‘uncertain  
626 tourism’ is a controversial situation that creates significant change around a tourism model  
627 and that leads to making political decisions. The case of climate change is rather specific  
628 because, as Latour (2017) suggested, there is scientific consensus on global warming being  
629 human-induced. Indeed, despite scientists’ agreement, it remains difficult for locals to accept  
630 the idea of a changing climate that disrupts significantly a money-making tourism system in  
631 their region. The value of this study lies in showing from a case-study the concrete character  
632 of climate change, a phenomenon that typically remains abstract and hardly noticeable. Low-  
633 altitude winter resorts presents an opportunity to observe organizational change and related  
634 conflicts, and ultimately, to question the territory government’s capacity to take up the  
635 challenge, govern, and decide matters.

636 At an organizational level, the various situations described earlier question the actors’  
637 ability to adapt to change and to consider new solutions. The low-altitude winter sports resorts  
638 are experiencing deep changes because of their dependence on snowfall. For a long time, they  
639 were in a stable period from an organizational and operational point of view. The  
640 relationships were stable and there was a large number of ‘intermediaries’ (Latour, 2005). The  
641 climatic risks and their effects have changed the situation and provoked the transition to a new  
642 phase, which is characterized by a transformation of the network. Relationships have to be

643 renegotiated by the stakeholders and this has helped to redeploy a multitude of ‘mediators’  
644 (Latour, 2005). The situation is particularly unstable because snowfall uncertainty has led to  
645 the deconstruction of the tourism network and to the reconfiguration of a new and different  
646 one, on a larger scale. This uncertainty creates major conflicts between interdependent  
647 stakeholders.

648         At a political level, the current climatic risks and snowfall problems have forced  
649 elected officials to reconsider their resort management model. While for many years, climate  
650 change (and its effects) has been a matter of fact, it has become a matter of concern (Latour,  
651 2004) and winter tourism policy has had to be redefined. It then had to open the black box of  
652 tourism policies in order to decide which sites are most likely to be profitable and apt at  
653 having snow and attracting tourists, with environmentally friendly features. This new policy  
654 did not provide full and immediate buy-in from the actors. It mainly generated a controversy,  
655 which then reconfigured the relations and the organization of the resorts at the territorial level.  
656 In the case under study, public actors have become more aware of the climatic changes and  
657 their consequences on winter tourism than private actors, who continue to be convinced that  
658 skiing can remain an attractive market for the territory.

659         While ANT has been of particular interest in tourism research over the last 10 years  
660 (Van Der Duim, Ren, & Johannesson, 2017; Beard, Scarles, & Tribe, 2016), this article  
661 contributes to the advancement of knowledge in this field for several reasons. First of all,  
662 studies on tourist controversies are rare in the literature whereas the analysis of controversies  
663 (or the mapping controversies) is at the center of the ANT approach. The instability of the  
664 social is privileged in ANT and controversial situations, of which there are many in the field  
665 of tourism, deserve special attention because they are often important organizational  
666 transformations. In addition, the research contributes to the knowledge of networks in winter  
667 sports resorts, as an extension of Paget et al.’s (2010) work. This research therefore had the  
668 ambition to mobilize at the same time the traditional approach of ANT while mobilizing other  
669 more recent theoretical evolutions. Thus, if the role of non-humans is particularly central in  
670 the analysis of tourism-scapes (Van Der Duim, 2007), as shown in the case of snow and the  
671 deconstruction of the tourism network, the study also wished to integrate in the analysis of the  
672 most recent elements around situations of uncertainty and controversy (Callon et al., 2011),  
673 which presents an added value in the understanding of tourism policies. The case of climate  
674 change is particularly relevant to these situations of political and organizational uncertainty  
675 that Callon et al. (2011) describe, and the transfer in the field of tourist studies is particularly  
676 interesting. Finally, the contribution of this research is mainly empirical since it contributes to

677 a better knowledge, by the in-depth description of the controversy, of the transformation of a  
678 tourist area and the coordination difficulties of the actors to adapt to the changes.

679 The various changes discussed in this study question the resilience of actors  
680 responding to change but also their ability to resist change. While winter tourism has been a  
681 lucrative economic activity in France for many years, the actors have been suddenly faced  
682 with changes that challenge their mode of organizing and funding, and they have had to adapt  
683 to this new uncertainty. The political decision is particularly complex because it has to decide  
684 on the future of a site and of a tourism activity sector, by making decisions in a context of  
685 uncertainty (Callon et al., 2011), without being able to project on future snowfalls and the  
686 development of the winter sports market. Small French winter resorts persist only because of  
687 public subsidies despite repeated financial losses. In this case, however, there appears to be a  
688 political willingness to change the tourism model and to forsake a skiing product that is  
689 destined to disappear. The challenge resides in public and private actors' ability to imagine  
690 and develop alternative products that would attract tourists. This situation further highlights  
691 the divide in the French Alps between low-altitude resorts that suffer from climate change and  
692 the very profitable high-altitude stations that do not have to question their operations and  
693 business model. Climate change leads to widening economic and social inequalities in some  
694 tourism destinations. A managerial consequence may be to test new development models on  
695 low-altitude resorts that could help mitigate problematic changes in mid-altitude stations that  
696 are already and increasingly affected by this phenomenon. Ultimately, it is the sustainability  
697 of a tourism model that is questioned and tested by this study. Similar to seaside destinations,  
698 those small skiing resorts may become "disappearing destinations" (Gössling, Scott, Hall,  
699 Ceron, & Dubois, 2012; Jones & Phillips, 2011). At least mountain resorts can rethink and  
700 design their future: low-lying seaside destinations do not have that chance.

701

## 702 **Funding**

703

704 The Natural Regional Park of Chartreuse partially funded this research

705

## 706 **References**

707

708 Agrawala, S. (2007). *Climate change in the European Alps. Adapting winter tourism and*  
709 *natural hazards management*. Paris: OECD.

710 Akrich, M., Callon, M., & Latour, B. (2002). The key to success in innovation. *International*  
711 *Journal of Innovation Management*, 6, 187–225. DOI: 10.1142/S1363919602000550

712 Arnaboldi, M., & Spiller, N. (2011). Actor-network theory and stakeholder collaboration: The  
713 case of cultural districts. *Tourism Management*, 32(3), 641-654. DOI:  
714 10.1016/j.tourman.2010.05.016

715 Atout France (2009). *Les chiffres clés du tourisme de montagne en France* [The key statistics  
716 of mountain tourism in France] (7th ed.). Paris: Atout France.

717 Bardin, L. (2007). *L'analyse de contenu* [Content analysis]. Paris: Presses Universitaires de  
718 France.

719 Beard, L., Scarles, C., & Tribe, J. (2016). Mess and method: Using ANT in tourism research.  
720 *Annals of Tourism Research*, 60, 97-110. DOI: 10.1016/j.annals.2016.06.005

721 Bloor, D. (1999). Anti-Latour. *Studies in History and Philosophy of Science*, 30(1), 81–112.

722 Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops  
723 and the fishermen of Saint-Brieuc Bay. In: Law, J. (Ed.), *Power, action and belief: A*  
724 *new sociology of knowledge?* (pp. 196–233), London: Routledge.

725 Callon, M., Lascoumes, P., & Barthe, Y. (2011). *Acting in an uncertain world: An essay on*  
726 *technical democracy*. Cambridge, MA: MIT Press.

727 Chateauraynaud, F. (1991). Forces et faiblesses de la nouvelle anthropologie des sciences  
728 [Strengths and weaknesses of the new anthropology of science]. *Critique*, 529-530, 459-  
729 478.

730 Cochoy, F. (2007). A brief theory of the ‘captation’ of publics. Understanding the market  
731 with little red riding hood. *Theory, Culture & Society*, 24(7–8), 203-223.

732 Cohen, E., & Cohen, S. A. (2012). Current sociological theories and issues in tourism. *Annals*  
733 *of Tourism Research*, 39(4), 2177-2202. DOI: 10.1016/j.annals.2012.07.009

734 Decrop, A. (1999). Triangulation in qualitative tourism research. *Tourism Management*,  
735 20(1), 157-161. DOI: 10.1016/S0261-5177(98)00102-2

736 Dedeker, A. (2017). Creating sustainable tourism ventures in protected areas: An actor-  
737 network theory analysis. *Tourism Management*, 61, 161-172.  
738 <http://dx.doi.org/10.1016/j.tourman.2017.02.006>

739 Dubois, M. (2007). La construction métaphorique du collectif: dimensions implicites du prêt-  
740 à-penser constructiviste et théorie de l'acteur-réseau [The metaphorical construction of  
741 the collective: Implicit dimensions of the constructivist ready-to-think and actor-  
742 network theory]. *L'Année sociologique*, 57(1), 127-150. DOI: 10.3917/anso.071.0127

743 Dubois, G., & Ceron, J.-P. (2006). Tourism and climate change: Proposals for a research



744 agenda. *Journal of Sustainable Tourism*, 14(4), 399-415. DOI: 10.2167/jost539.0

745 Elsasser, H., & Messerli, P. (2001). The vulnerability of the snow industry in the Swiss Alps.  
746 *Mountain Research and Development*, 21(4), 335–359. DOI: 10.1659/0276-  
747 4741(2001)021[0335:TVOTSI]2.0.CO;2

748 Elsasser, H. B., & Bürki, R. (2002). Climate change as a threat to tourism in the Alps. *Climate*  
749 *Research*, 20(3), 253-257. DOI: 10.3354/cr020253

750 Franklin, A. (2004). Tourism as an ordering: Towards a new ontology of tourism. *Tourist*  
751 *Studies*, 4(3), 277-301. DOI: 10.1177/1468797604057328

752 Friedberg, E. (1996). *Powers and rules. The organizational dynamics of collective action.*  
753 Paris: Avebury.

754 Frochot, I., & Kreziak, D. (2008). Customers' perceptions of ski resorts' images: Implications  
755 for resorts' positioning strategies. *Tourism and Hospitality Research*, 8(4), 298-308.  
756 DOI: 10.1057/thr.2008.27

757 Garfinkel, H. (1967). *Studies in ethnomethodology.* Cambridge: Polity Press.

758 Glaser, B., & Strauss, A. (1968). *The discovery of grounded theory.* London: Weidenfeld and  
759 Nicolson.

760 Gössling, S., Scott, D., Hall, C. M., Ceron, J. P., & Dubois, G. (2012). Consumer behaviour  
761 and demand response of tourists to climate change. *Annals of Tourism Research*, 39(1),  
762 36-58. DOI: 10.1016/j.annals.2011.11.002

763 Grossetti, M. (2007). Les limites de la symétrie [The limits of symmetry]. *Sociologies* [On  
764 line], retrieved from <http://sociologies.revues.org/712>

765 Guerin, J. P. (1984). *L'aménagement de la montagne. Politiques, discours et productions*  
766 *d'espaces.* Gap: Editions Ophrys.

767 Hollinshead, K. (2006). The shift to constructivism in social inquiry: Some pointers for  
768 tourism studies. *Tourism Recreation Research*, 31(2), 43-58. DOI:  
769 10.1080/02508281.2006.11081261

770 Jamal, T., & Hollinshead, K. (2001). Tourism and the forbidden zone: The underserved power  
771 of qualitative inquiry. *Tourism Management*, 22(1), 63-82. DOI: 10.1016/S0261-  
772 5177(00)00020-0

773 Johannesson, G. (2005). Tourism translations: Actor-network theory and tourism research.  
774 *Tourist Studies*, 5(2), 133–150. DOI: 10.1177/1468797605066924

775 Jones, A. L., & Phillips, M. R. (Eds.) (2011). *Disappearing destinations: Climate change and*  
776 *future challenges for coastal tourism.* Wallingford: CABI.

777 Jørgensen, M.-T. (2017). Reframing tourism distribution - Activity Theory and Actor-  
778 Network Theory. *Tourism Management*, 62, 312-321.  
779 <https://doi.org/10.1016/j.tourman.2017.05.007>

780 Koenig, U., & Abegg, B. (1997). Impacts of climate change on winter tourism in the Swiss  
781 Alps. *Journal of Sustainable Tourism*, 5(1), 46-58. DOI: 10.1080/09669589708667275

782 Law, J. (1994). *Organizing modernity*. Oxford: Blackwell.

783 Latour, B. (1987). *Science in action. How to follow scientists and engineers through society*.  
784 Cambridge, MA: Harvard University.

785 Latour, B. (1993). *We have never been modern*. Brighton: Harvester Wheatsheaf.

786 Latour, B. (1996). *Aramis or the love of technology*. Cambridge, MA: Harvard University.

787 Latour, B. (2004). *Politics of Nature: How to Bring the Sciences into Democracy*. Cambridge,  
788 MA: Harvard University.

789 Latour, B. (2005). *Reassembling the social. An introduction to actor-network-theory*. Oxford:  
790 Oxford University Press.

791 Latour, B. (2017). *Facing Gaia: Eight lectures on the new climatic regime*. Cambridge: Polity  
792 Press.

793 Miles, M., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd  
794 ed.). Thousand Oaks, CA: Sage.

795 Moen, J., & Fredman, P. (2007). Effects of climate change on alpine skiing in Sweden.  
796 *Journal of Sustainable Tourism*, 15(4), 418–437. DOI: 10.2167/jost624.0

797 Morrison, C., & Pickering, C. (2012). Perceptions of climate change impacts, adaptation and  
798 limits to adaption in the Australian Alps: The ski-tourism industry and key stakeholders.  
799 *Journal of Sustainable Tourism*, 21(2), 1-19. DOI:10.1080/09669582.2012.681789

800 Mucchielli, A. (1996). Interview non directive (ou compréhensive) centrée [Centered non-  
801 directive interview]. In: Mucchielli, A. (Ed.), *Dictionnaire des méthodes qualitatives en*  
802 *sciences humaines et sociales [Dictionary of qualitative methods in human and social*  
803 *sciences]* (pp. 109-110), Paris: Armand Colin.

804 Paget, E., Dimanche, F., & Mounet, J.-P. (2010). A tourism innovation case: An actor-  
805 network approach. *Annals of Tourism Research*, 37(3), 828-847. DOI:  
806 10.1016/j.annals.2010.02.004

807 Pernecky, T., & Jamal, T. (2010). (Hermeneutic) Phenomenology in tourism studies. *Annals*  
808 *of Tourism Research*, 37(4), 1055–1075. DOI: 10.1016/j.annals.2012.07.009

809 Phillimore, J., & Goodson, L. (2004). *Qualitative research in tourism: Ontologies,*  
810 *epistemologies and methodologies*. London: Routledge.

811 Rech, Y., & Paget, E. (2017). Saisir les transformations des sports de nature par la théorie de  
812 l'acteur-réseau [Using actor network theory to understand the transformation of nature  
813 sports]. *Sciences de la société*, 101.

814 Ren, C., Pritchard, A., & Morgan, N. (2010). Constructing tourism research: A critical  
815 inquiry. *Annals of Tourism Research*, 37(4), 885-904. DOI: 10.1016/j.annals.2009.11.00

816 Ren, C. (2011). Non-human agency, radical ontology and tourism realities. *Annals of Tourism  
817 Research*, 38(3), 858-881. DOI: 10.1016/j.annals.2010.12.007

818 Riley, W. R., & Love, L. L. (2000). The state of qualitative tourism research. *Annals of  
819 Tourism Research*, 27(1), 164-187. DOI: 10.1016/S0160-7383(99)00068-

820 Rodger, K., Moore, S., & Newsome, D. (2009). Wildlife tourism, science and actor network  
821 theory. *Annals of Tourism Research*, 36(4), 645-666. DOI:  
822 10.1016/j.annals.2009.06.001

823 Scott, D., McBoyle, G., Minogue, A., & Mills, B. (2006). Climate change and the  
824 sustainability of ski-based tourism in Eastern North America: A reassessment. *Journal  
825 of Sustainable Tourism*, 14(4), 376-398. DOI: 10.2167/jost550.0

826 Simpson, M. C., Gössling, S., Scott, D., Hall, C.M., & Gladin, E. (2008). *Climate change  
827 adaptation and mitigation in the tourism sector: Frameworks, tools and practices*.  
828 Paris: UNEP, University of Oxford, UNWTO, WMO.

829 Soboll, A., & Dingeldey, A. (2012). The future impact of climate change on Alpine winter  
830 tourism: A high-resolution simulations system in the German and Austrian Alps.  
831 *Journal of Sustainable Tourism*, 20(1), 101–120. DOI: 10.1080/09669582.2011.610895

832 STRMTG (2015). *Rapport d'activité 2015 [Activity report 2015]*. Saint-Martin d'Hères  
833 (France): Service Technique des Remontées Mécaniques et des transports guidés  
834 (STRMTG), Ministère de l'Écologie, du Développement Durable et de l'Énergie.  
835 Retrieved from [http://www.strmtg.equipement.gouv.fr/IMG/pdf/rapport-activite-  
836 STRMTG-2015.pdf](http://www.strmtg.equipement.gouv.fr/IMG/pdf/rapport-activite-STRMTG-2015.pdf)

837 Thietart, R.-A. (2001). *Doing management research: A comprehensive guide*. London: Sage.

838 Tribe, J. (2010). Tribes, territories and networks in the tourism academy. *Annals of Tourism  
839 Research*, 37(1), 7-33. DOI: 10.1016/j.annals.2009.05.001

840 Urry, J. (2005). *Sociologie des mobilités [Sociology of mobilities]*. Paris: Armand Colin.

841 Vanat, L. (2018). *International report on snow and mountain tourism: Overview of the key  
842 industry figures for ski resorts*. Geneva (Switzerland): Laurent Vanat. Retrieved from  
843 <http://www.vanat.ch/RM-world-report-2018.pdf>

844 Van Der Duim, R. (2005). *Tourismscapes: An actor-network perspective on sustainable*

845 *tourism development*. Doctoral dissertation, Dissertation Wageningen University, The  
846 Netherlands.

847 Van Der Duim, R. (2007). Tourismscapes: An actor-network perspective. *Annals of Tourism*  
848 *Research*, 34(4), 961-976. DOI: 10.1016/j.annals.2007.05.008

849 Van Der Duim, R., Ren, C., & Johannesson, G. (2017). ANT: A decade of interfering with  
850 tourism. *Annals of Tourism Research*, 64, 139-149. DOI: 10.1016/j.annals.2017.03.006

851 Walle, A. H. (1997). Quantitative versus qualitative tourism research. *Annals of Tourism*  
852 *Research*, 24(3), 524-536. DOI: 10.1016/S0160-7383(96)00055-2

853 Weber, M. (1978). *Economy and society*. Berkeley, CA: University of California.

854 Westwood, S., Morgan, N., & Pritchard, A. (2006). Situation, participation and reflexivity in  
855 tourism research: Furthering interpretive approaches to tourism enquiry. *Tourism*  
856 *Recreation Research*, 31(2), 33-42.

857 Wolfsegger, C., Gössling, S., & Scott, D. (2008). Climate change risk appraisal in the  
858 Austrian ski industry. *Tourism Review International*, 12(1), 13-23. DOI:  
859 10.3727/154427208785899948

860 Yin, R. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA:  
861 Sage.

Figure 1: Map of the site investigated

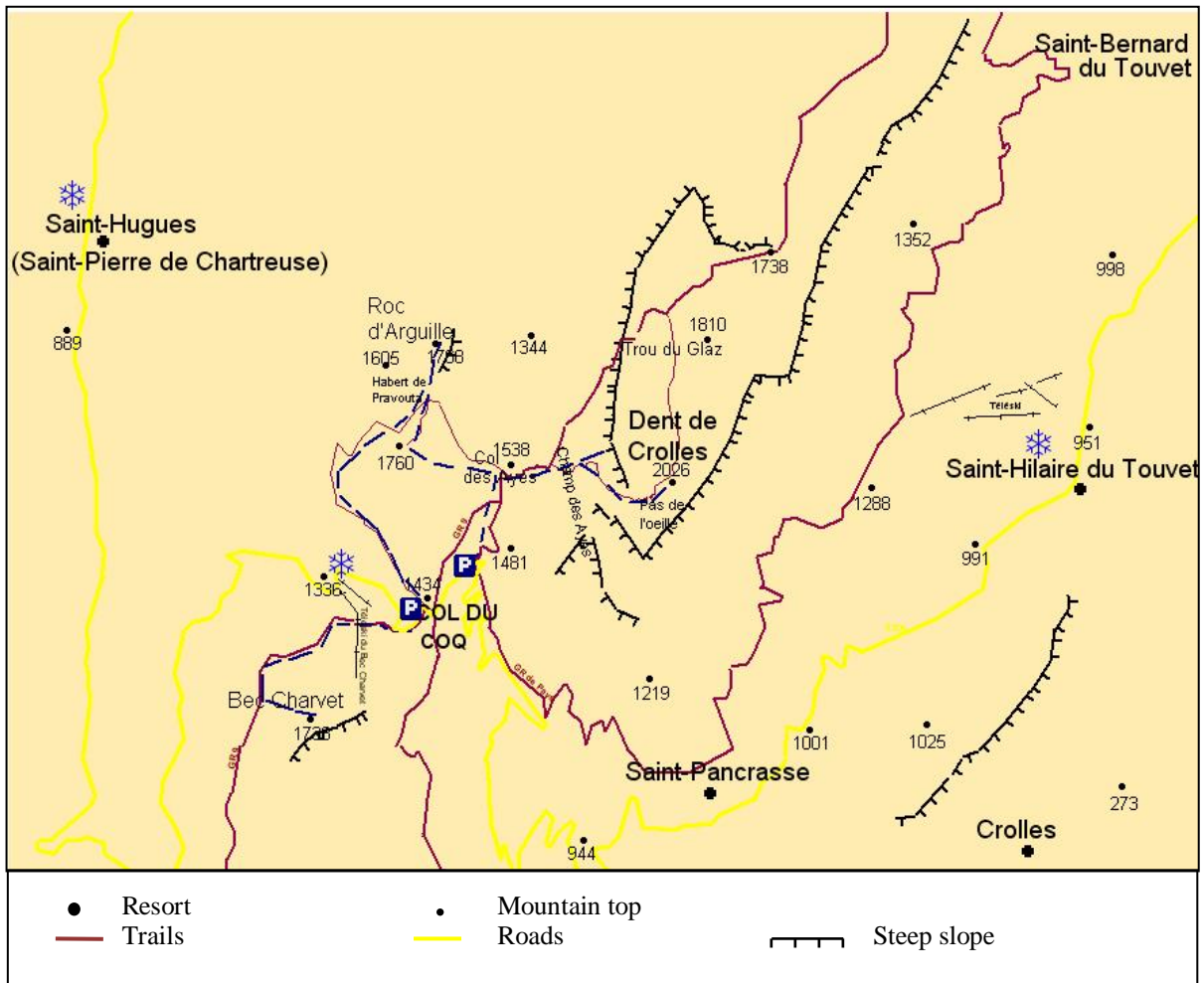


Table 1: Type and number of interviewed actors

<b>Number of interviews</b>	<b>Type of structure</b>	<b>Job titles or activities</b>
<b>Protected area and/or environmental managers (n=6)</b>		
	Natural Regional Park of Chartreuse	Scientific manager
	Natural Regional Park of Chartreuse	Manager of outdoor recreation
	Departmental council	Environmental manager
	Departmental council	Environmental Guide
	Nature Reserve of Chartreuse	Guard
	National Forestry Office	Technicians
<b>Municipal and inter-municipal elected officials (n=5)</b>		
	<i>Saint-Hilaire city</i>	Elected representative
	<i>Saint-Pierre de Chartreuse city</i>	Elected representative
	<i>Saint-Bernard city / PPR community</i>	Elected representative
	<i>Saint-Pancrasse city</i>	Elected representative
	Local council community	Elected representative
<b>Tourist offices (n=2)</b>		
	Tourism office ( <i>Saint-Pierre de Chartreuse city</i> )	Director
	Tourism office ( <i>Saint-Hilaire city</i> )	Director
<b>Host (n=1)</b>		
	Holiday cottage renter	Director
<b>Recreational activity providers (n=5)</b>		
	Guides company	Mountain guide and ski instructor
	Hiking provider	Independent and journalism
	Hiking office guides	Director
	Paragliding schools	Director
	Paragliding provider	Independent
<b>Sports and recreation associations (n=3)</b>		
	Climbing association	President
	Icare cup Events and association of friends of the <i>col du Coq</i> resort	President
	Hunting association	President
<b>Environmental protection NGO (n=1)</b>		
	Mountain Wilderness	Project manager

<b>Other (n=2)</b>		
	Departmental council	Director of the tourism department
		Farmer

Figure 2: The deployed arguments

