



1 **Enjoying the ice. Dutch Winter landscapes, weather and** 2 **climate in the Golden Age, 17th century**

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7 **Abstract.** This article explores Dutch winter landscapes from the 17th century, in light of written climatic sources.
8 It investigates different kinds of climatic elements and winter weather types that were favoured by the artists during
9 the Little Ice Age. The comparison between a corpus of paintings and narrative records show an overrepresentation
10 of cold and dry weather in painted representations, in comparison to the written documents. Indeed, we can
11 estimate that such particularly cold and dry weather corresponded to less than 20% of winter days. Thus, the Dutch
12 painters produced a winter imagery supported by icy scenes, in which the Dutch practiced skating. We interpret
13 this choice by examining hypotheses based around four themes: climatic, religious, political, and social. Finally,
14 despite their historical relevance, these winter landscapes are a *genre*, and only show very partially the diversity
15 of winter weather during the 17th century and the Little Ice Age.

16

17 **Keywords:** Weather, climate, winter, Little Ice Age, Golden Age, painting, landscape

18

19 **1. Introduction**

20

21 During the 17th century, the Dutch population experienced the Little Ice Age (LIA), “an epoch of cooler average
22 temperature prevailing generally from the end of “medieval warming” to the beginning of our contemporary era
23 of global warming” (de Vries, 2013, p.371). Cold winters and fresh summers were frequent. The duration of this
24 period is not precisely defined (Büntgen and Hellmann, 2013; Le Roy Ladurie, 2004; White, 2013). Nevertheless,
25 the authors all agree that the 17th century was one of the coldest centuries in the second millennium (Le Roy
26 Ladurie, 2004; Mauelshagen, 2012). Numerous researchers have been working on this period, trying to estimate
27 its “natural” components, such as temperature and precipitation. Another research focus has been on the societal
28 impacts of this colder period. Yet, the link between a climatic trend and the societies’ reaction and adaptation to
29 it, are still being discussed (de Vries, 2013; White, 2013).

30 In parallel of this climatic variability, “seventeenth-century Dutch painting is the most obvious manifestation of
31 all the changes that took place during the Golden Age” (North, 1999, p.1). Through the 17th century, landscapes
32 became a “genre” (Alpers, 2009; Sutton et al., 1987; Todorov, 2017). Included in this new artistic category, winter
33 landscapes were produced by numerous painters, among which the most famous is probably Hendrick Avercamp.
34 He was the first Dutch painter to represent winter scenes at the beginning of the 17th century, after the Flemish –
35 Brueghel the older, Jacob Grimmer, or Luckas van Valckenborch. Avercamp’s winter scenes were appreciated
36 and rediscovered in the context of great exhibitions (Roelofs, 2009; Suchtelen, 2002). Many other Dutch painters
37 are also well-known for their winter landscapes, such as Jan van Goyen, Aert van der Neer, or Jacob van Ruisdael.



38 In this paper, we focus on a period going from 1608 to 1672. The 1608 winter was severe, and also corresponds
39 to the first painting of a Dutch winter landscape, by Avercamp. In 1672, the *rampjaar* disaster took place, as France
40 governed by Louis XIV invaded the Netherlands. The Golden Age thus came to an end (Prak, 2009).

41 Our research connects the two fields of history of art and history of climate together, along with the study of
42 cultural appropriation, and depictions of weather and climate (Hulme, 2016; Jankovic, 2000). It is nowadays a
43 fructuous place for interdisciplinary research between geography, anthropology, ethnology, and history. Several
44 studies pertaining to the LIA emphasized links between the climate and cultures (Behringer, 1999; Behringer et
45 al., 2005). Yet, “ordinary” landscape paintings have not been closely examined. Only a few studies have explored
46 European landscape paintings with climatic analyses (Camuffo, 1987, 2010; Gedzelman, 1991; Nussbaumer,
47 2012; Zerefos et al., 2007). Indeed, most geographers looking at paintings either draw on cultural geography, or
48 visual studies (Daniels and Cosgrove, 1988; Grison, 2002; Staszak, 2003). Though such areas of research are
49 important in our own interpretations, natural – including climatic – elements are still often neglected, whereas
50 “like photographs, paintings constitute a form of evidence that can provide information (albeit mediated) about
51 past landscapes that is different from the information contained in other sources” (Gaynor and McLean, 2008,
52 p.189). Through this pluri-disciplinary focus, we investigate Dutch winter landscape reflections, and likelihood to
53 winter weather at that time. To make this comparison, we use the methods of climate historians, art historians, and
54 cultural geographers altogether. In our view, it is necessary to devote greater attention to the paintings displaying
55 both historic and climatic dimensions. Do these winter paintings really show the natural and social conditions of
56 winter at that time? This question has only been partially encompassed (Burroughs, 1981; Degroot, 2014; Goedde,
57 2005; Robinson, 2005; Roelofs, 2009). We do not only focus on what is depicted in the paintings, as art historians
58 do, but also on what could have been depicted according to the written sources. What is missing is probably not a
59 coincidence, but a choice requiring explanations.

60 First, we highlight the corpus of paintings, and the written sources we use. Then, we show how the comparison
61 between the paintings and the archival documents reveals the kind of weather the artists preferred. We finally
62 suggest several hypotheses explaining these choices.

63

64

65 2. Material and methods

66

67 2.1. A corpus of winter landscapes

68

69 The analysis is based on a corpus of 49 winter paintings. The total amount of winter landscapes produced during
70 the Golden Age is unknown. Many paintings have either disappeared, or are kept in private collections. Therefore,
71 it is impossible to be exhaustive in our findings. In order to be representative, we have decided to focus on the 49
72 paintings reproduced in the only international exhibition devoted to winter landscape paintings in the 17th century
73 (Suchtelen, 2002). Following this recension, we proceeded to a statistical analysis inspired by researchers in
74 quantitative geography and history of art (Brulez, 1986; Gedzelman, 1990; Joyeux-Prunel, 2008, 2013). The idea
75 is to understand whether or not an element identified in one painting often appears in the other paintings as well.
76 Thus, we are not only able to examine the weather in one specific painting, but also to get a grasp of the main



77 weather types painted in our entire corpus. In a way, it creates an “average” of the weather elements, and allows
78 us to picture the “climate” in one artificial image.
79 One landscape painting shows a particular moment in a day. Hence, the image exposes one weather type, defined
80 by the following criteria: the rain or the absence of rain, where the wind comes from, the type of clouds painted,
81 etc. A few authors tried to analyse landscape paintings in the light of meteorological processes (Gedzelman, 1991).
82 As for the 17th century, they concluded the weather is, in majority, coherent with the scientific knowledge we have
83 of that period nowadays. Even if the “real” skies might happen to be exactly those painted at the time, meteorology
84 as a science was nevertheless at its very first attempts. For instance, cloud classification was only invented in 1802.
85 Even more impressive, as the painters used to work indoors, they could see the sky from the inside, but not the
86 scene they wanted to create.
87



88
89 Figure 1: Salomon van Rusydael, Drawing the Eel, early 1650s, Metropolitan Museum of Art, oil on panel, 74,9
90 x 106 cm

91 https://commons.wikimedia.org/wiki/File:Drawing_the_Eel_MET_DP147902.jpg

92

93 In this painting by Jacob van Ruysdael (Fig. 1), there are some elements with meteorological coherence. On the
94 left side, one distinguishes icy water. A few people and horses are moving toward the inside, which means the tide
95 is reasonable, min. 15 cm. On the right side, the trees have no leaves. The leaves have already fallen, probably
96 because of the wind and tempests, which are quite frequent in the Netherlands during winter. As the trees have no
97 leaves, the scene certainly takes place after November, and probably after December. The flag, at the top of the
98 big house, indicates the wind is coming from the left. Moreover, the people’s shadows indicate the sun is shining



99 from the left. Finally, the number of people watching the game tells us the scene takes place during the afternoon.
100 These elements all show the wind comes from the left side, from the west. The clouds are totally coherent: cirrus
101 in the top and right side, cumulus in the middle, and probably stratus in the left and bottom side of the painting.
102 After a period of severe frost, caused by the stagnation of an anticyclone -as testified by the absence of snow-, a
103 perturbation comes from the west, and will soon cover the sky. In a few hours, it will probably snow. Thus, as for
104 the majority of paintings we focus on, all the elements are well painted, according to a *weathered* “reality” (in
105 Mike Hulme’s terminology). Yet, using this kind of painting, is it possible to have any *climatic* indication?
106

107 2.2. Climatic sources

108

109 Our study includes written sources as well, since “most reconstructions from archives natural cannot be broken
110 down to seasonal or monthly resolution and they do not always yield a distinct separation of the effects of
111 temperature and precipitation” (Brázdil et al., 2005, p.375). Winter narratives rely on climatic archives, often
112 disseminated among the different archive categories (agriculture, economy, war, religion, etc.). Indeed, throughout
113 history, people have always given their impression about the weather (Pfister et al., 1999; Thomasset and Ducos,
114 1998). Nowadays, even though the scientific, meteorological measures are well developed around the world, many
115 people still share their own observations (Endfield and Morris, 2012). Martin de la Soudière speaks about
116 “*metéophiles*”, or weather enthusiasts (de La Soudière and Tabeaud, 2009).

117 In the 17th century, weather enthusiasts were, in a large majority, men. They were either members of the clergy
118 and nobility, or scientists, farmers, doctors, and so on. David Fabricius is one of the most interesting of them. He
119 lived in Friesland. He had a very accurate perception of the weather; for instance, he used around 70 expressions
120 to speak about frost (Metzger and Tabeaud, 2017). At the beginning of the 17th century, savants, such as Nicolaes
121 van Wassener, used the first thermometers. From November 1612 to March 1615, Isaac Beeckman set up the first
122 “weather station” in Amsterdam (featuring a weather vane and a thermoscope, an ancestor of the thermometer).
123 From 1655 to 1667, Fabio Chigi – pope Alexander VII – also made meteorological observations. At the end of the
124 17th century, a shipowner and merchant, based in Koog aan de Zaan, recorded the weather over a 60-year period.
125 To have a good overview of past weathers described by weather enthusiasts, we chose to use Jan Buisman’s books
126 (Buisman, 2011; Buisman and Engelen, 2000, 2006). The author has produced an impressive and critical inventory
127 of different, primary and secondary sources: chronicles, letters, weather observations, etc. This corpus provides a
128 relevant overview of winters during the Golden Age.

129 3. Results

130

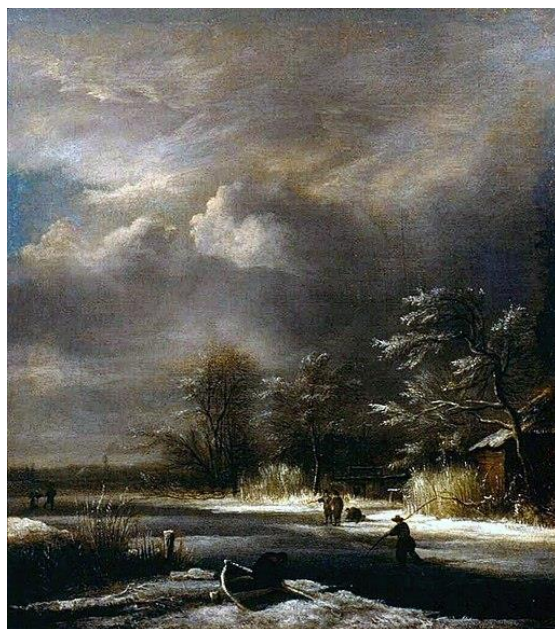
131 3.1. Paintings and climatic diachronies

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133
134 We surveyed our corpus of landscape artworks and show that the climatic elements were chosen by the painters.
135 They represented ice, but no rain. Where there is snow, it never falls, and is always very thin on some parts of the
136 rooftops. The preferred clouds are the stratus and the cumulus. The skies are always depicted with clouds, which



137 coheres with today's observations. From the west to the north-east of the Netherlands, for the period 1981-2010,
138 only 30 to 45 days have more than 80 % of sunny conditions¹.
139 A diachronic analysis of the statistical results revealed two main weather types according to the period. At the
140 beginning of the 17th century, painters like Avercamp, van Goyen, or van Ruysdael preferred to paint stable and
141 cold situations. The stratus clouds were dominant. In our corpus of 49 paintings, 17 paintings until 1650 show
142 stratus (among 27), but only 1 after 1650 (among 22). The water, whether a river, a lake, a marsh, etc., was frozen.
143 After 1650, cold weather was still dominant: the ice covered all the waters. Yet, the clouds indicated that a weather
144 front was moving with more cumulonimbus or nimbostratus. It is also coherent with the amount of people
145 outside, and with their activities taking place in the winter landscapes. Until ca. 1650, the ice was covered by a
146 melting-pot of people. Even when the weather was not sunny (with stratus indeed), the people went outside to
147 enjoy the ice. Throughout the second period, we see less people on the ice and the percentage covered by ice in
148 the paintings has also changed: 45% until 1650, 35% after. As the painters could imagine, the moving front was
149 probably passing the land, with windy and less comfortable conditions for people (for example here in Figure 2).
150



151
152 Figure 2: Jacob van Ruisdael, Winter Landscape with skaters, Museum Boijmans van Beuningen, oil on canvas,
153 37,7 x 33,5 cm.

154 https://commons.wikimedia.org/wiki/File:Jacob_van_Ruisdael_-_Winter_Landscape_with_Skaters.jpg

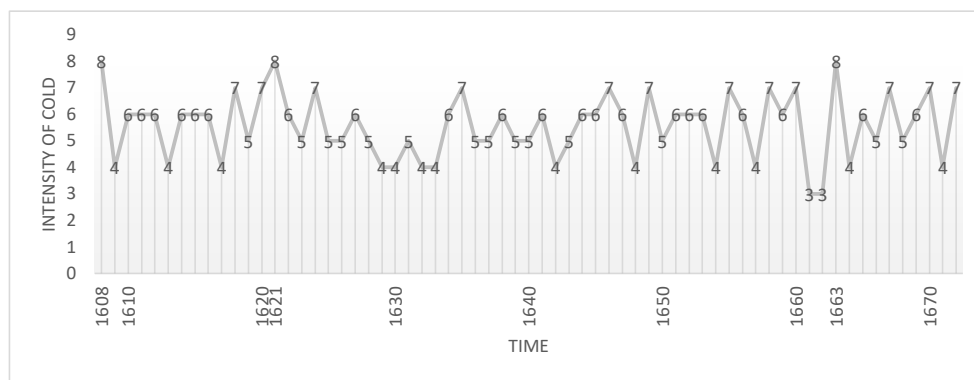
155

156 Such a difference between the two periods does not reflect the climatic archives, and does not cohere with climatic
157 variabilities. Two imaginaries of winter were preferred. Indeed, Buisman and van Engelen (Buisman and Engelen,

¹<http://www.klimaatatlas.nl/klimaatatlas.php?wel=zon&ws=kaart&wom=Aantal%20dagen%20zeer%20zonnig>.



158 2000) have set up a classification of the cold in winter, from the mildest (1) to the severest (9). In the 17th century,
159 16 winters were mild, 13 winters were in the average (index 5), and all the other 43 winters were at least “cold”
160 (index 6, 7 and 8, with no extremely cold winter during our period). Yet, there is no major distinction between the
161 first, and the second part of the 17th century as Figure 3 shows.
162



163
164
165 Figure 3: The variability of cold during winter in the Netherlands (1608-1672). 1608, 1621 and 1663 are the most
166 severe during this period.

167
168 This means the frost was not permanent throughout the three winter months (December, January, and February).
169 For some winters, such as in 1617 and 1670, we have many reports of mild temperatures, trees with flowers in
170 February, and the impossibility to skate.
171 Some specific links between climate history and winter landscapes seem to be relevant. On the one hand, 1608
172 was an extremely cold winter. Several narrative sources mention frozen rivers, such as the Seine, the Tames, the
173 Rhine, and even the Rhône. In the Netherlands, Dirk Velius, a doctor in Hoorn, reported frost from January 1st
174 until March. As already emphasized, “Coincidence or not, in 1608, Hendrick Avercamp painted his first dated
175 winter scene after the extremely hard winter of 1607-08. It would seem unarguable that severe winters like those
176 of 1664-65 and 1607-08 made an enormous impression on the people and have found a place in the Dutch
177 collective memory” (Roelofs, 2009, p.29).
178 On the other hand, there is a scarcity of winter landscapes from the end of the 1620’s to the end of the 1630’s. This
179 period also shows relatively mild winters. During the 1630 decade, only 1634, 1635, and 1638 were “cold” winters,
180 according to Buisman and van Engelen (see table 1). Shortly after this period, both cold winters and winter
181 landscapes reappeared (Straaten, 1977, p.113). For instance, Jan van Goyen came back to painting winter scenes
182 in 1641, whereas his last winter scene dated from 1627. The year 1641 also saw the first, dated winter painting by
183 Aert van der Neer, who then painted ca. 150 canvasses. Curiously not famous in his own time, he was tenant of an
184 inn, and miserably died in 1677.

185 Yet, is such a dominance of cold weather coherent with the winter archives?

186

187 3.2. An imagery of cold weather

188



189 We use the weather compilation made by Jan Buisman as basis for our results. Fabricius' observations from 1594
190 to 1612 provide us with information about the percentage of "winter" days (Metzger & Tabeaud, 2017). Buisman
191 used the original source and often provides enough information from Fabricius' notebook to draw pertinent
192 conclusions as regards weather types. However, Buisman's work is incomplete and some of his approximations
193 are too imprecise to show how each winter unfolded. For example: "there follows a milder and darker weather
194 along with rain [January 2nd – January 30th 1596]". Sometimes we must therefore "make do" and suggest
195 reconstructions despite such approximations taken from a second-hand source reference. To summarise the
196 sequence of winter weather types, we must rely upon the works of Olivier Cantat (2015). Our reconstruction is
197 therefore based on a combination of 6 winter weather types taking into account the mention of frost (or not) and
198 of precipitation (or not).

199 The following table sums up our results (table 1). We would add that Buisman's written notes did not allow us to
200 reconstruct these weather types for 10 days in 1598, 11 days in 1599, 6 days in 1660, 6 days in 1601, 7 days in
201 1603, 2 days in 1604 and 4 days in 1607. It is also needs to be remembered that these uncertainties are sometimes
202 significant, due to Buisman's approximations. Moreover, unfortunately, Fabricius is the only winter enthusiast
203 allowing us to make such a kind of reconstruction. Nevertheless, this period being one of the coldest during the
204 LIA, we can assume the percentage of days without frost was still important throughout the rest of the 17th century.

205

206 Table 1: Percentages for the different winter weathers from 1594 to 1612, in December, January, and February
207 (Buisman and Engelen, 2000)

208

A Frost and precipitations	5,5 %
B Frost without precipitations	16,8 %
C Frost-thaw alternation with precipitations	12 %
D Frost-thaw alternation without precipitations	14,2 %
E No frost and precipitations	26,1 %
F No frost without precipitations	25,4 %

209

210 Several comments can be made. First of all, the most frequent weather types are E and F: on average over half of
211 winter days had no frost. On the other hand, weather type A is less frequent, which makes sense: cold spells
212 arriving from Western Europe are brought in by high, even Nordic, continental pressure, causing little to no rain
213 at all. Next, we notice that the sum of weather types A+B is 22.3%. Lastly, it appears that days with precipitation
214 (of all types) account for 43.6% (A+C+E). Admittedly, it is possible that Fabricius did not record any precipitation
215 when there was very little water or snow falling during a day or a night, perhaps because he did not notice such
216 short showers.

217 Comparing winter archives and winter paintings showed the painters represented a single kind of winter weather
218 – frost without rain –, which appeared less than 1/5 days, according to Fabricius' weather records. Furthermore,
219 they only represented snow in some parts of the paintings, whereas a lot of snow fell during some winter days.
220 Whenever the cold conditions came after the fall, the snow could remain for a long time. For instance, the weather
221 enthusiasts spoke about 40 cm of snow in Den Haag in January 1667, and 20 cm in Utrecht in December 1672.



222 Fabricius also spoke about snow tempests in February 1610, and January 1612. These images of winter have
223 completely disappeared in the paintings.

224

225 3.3. A landscape climatic figure? 4 hypotheses

226

227 The painters selected a type of winter weather to build an image, even an imaginary of the winter season. Our
228 image of the LIA is partly transmitted by these paintings, and it is very misleading. The paintings we see in the
229 museums, on the Web, or in exhibition catalogues, only show specific moments during winters. Why did the
230 painters represent this image of winter? We now emphasize four different hypotheses.

- 231 1) **Climatic.** The winters were particularly cold at that time. It probably influenced the painters who
232 experienced such moments of cold weather. There are some meaningful dates: the 1608 winter was very
233 severe, and saw Avercamp's first winter landscape painting. The master of the ice scene was probably
234 haunted by the weather he experienced in Kampen, east of Amsterdam. The cold conditions would also
235 freeze water more frequently. Curiously, the Zuiderzee is always frozen in Avercamp's paintings. It is an
236 image the painter wanted to transmit, even though the sea did not freeze every winter, according to the
237 written documents. Moreover, as the cold winters were dominant, it meant the winter times were a period
238 when water was not an enemy. Frozen water could be tamed and appropriated, whereas liquid water was
239 a potential danger because of the impressive floods - even though the Dutch people energetically strove
240 to prevent the flooding of their land. More in details: "Only when frozen is water harmless. To celebrate
241 this temporary power over the natural enemy, I think it is such an irresistible attraction to the inhabitants
242 of our delta. On the ice, the world is literally and figuratively upside down: the catharsis of the national
243 primeval goose" (Koolhaas, 2010, p.157).
- 244 2) **Religious.** The Reformation could partly explain this picture of cold winter landscapes. In certain Catholic
245 narratives, a severe cold is the devil's place. In Dante's *Divine Comedy*, the frozen places are among the
246 most terrible. Moreover, before Brueghel the older's 1565 winter paintings, the few European paintings
247 to represent ice used to link the ice to the underworld (such as in Jérôme Bosch's *Garden of Earthly
248 Delights*). In the reformed religion, amusements were admitted. It means skating was not seen as a
249 depraved activity anymore: Avercamp's pictures "are also the first to include fun on the ice" (Waterman
250 Gallery (Amsterdam, Netherlands) and Blankert, 1982, p.22). Furthermore, the landscape genre could
251 also be a reaction to the Catholic paintings, more specialized in still lives and portraits: it was a "relatively
252 new genre which had no ties with traditional Catholic belief and iconography" (Falkenburg and Finney,
253 1999, p.359).
- 254 3) **Political.** The Peace Truce with Spain also played a role. During the war period, as frozen waters did not
255 stand as "natural" limits anymore, they could be a disadvantage for the Dutch. A good defensive strategy
256 consisted in the artificial flooding of some parts of the territory. However, it was not possible in cold
257 conditions, when the water was frozen. Thus, as the Truce between the United Provinces (the
258 Netherlands) and Spain was concluded during the very severe month of February 1608, the cold winter
259 paintings could be interpreted as a symbol of the celebrated "peace". Frozen waters were not a danger
260 anymore. These paintings could also evoke the supremacy of the Dutch, skating in times of war
261 (Koolhaas, 2010). Some winter episodes are very famous in the history of the United Provinces, such as



262 the siege of Haarlem, or Lambert Melisz's 1574 adventure, passing the enemy lines with a skate and a
263 sledge, together with his mother. Finally, to celebrate winter in the paintings could also contribute to
264 creating a landscape climatic figure, in contrast with the Spanish landscapes. Indeed, though the Spanish
265 painters produced less landscape paintings than the Dutch, they represented in majority summer
266 conditions (Alonso Cano, Juan Bautista Maino, El Greco, Francisco Collantes, Velázquez, etc.) (Gallego,
267 1968; Pérez Sánchez and Royal Academy of Arts, 1976). To paint so many winter scenes throughout the
268 Golden Age was possibly, for the Dutch, a way to build their nation after the Spanish domination
269 (Metzger and Tabeaud, 2015).

270 4) *Social*. To represent the ice was a way to create and anchor a Dutch identity. On the ice, all the social
271 classes skated together. The ice was the place where both the rich and the poor walked, played, and so on
272 (Roelofs, 2009). Furthermore, during the cold winters, it was easier to move in the country. The density
273 of rivers, lakes, and new canals only enabled the Dutch people to visit their family with skates. For
274 instance, in 1658, Johan Huydecoper's son visited his family around Amsterdam with his skates (Buisman
275 and Engelen, 2000): Amstelveen (January 14th-15th), Spaarndam (January 16th), Halfweg and Meresteijn
276 (January 21st), Bijlmer (24th), Amsterdam (25th), Amstel (30th), Muiden and Naarden (31st), Uithoorn and
277 Maarseveen (February 1st). One of the written records was held by Caescooper: on December 19th
278 1676, he skated almost 200 km in 17 hours (Buisman and Engelen, 2006). It is a prefiguration of the
279 famous Elfstedentocht, in Friesland{Citation}. Without these cold conditions, the Dutch needed a barge
280 of their own, or to pay for barges and diligences, in order to travel in the Netherlands.

281 Thus, in François Walter's inventories (2004), icy landscapes could stand as one of the *climatic* landscape figures
282 to exist in Europe. Indeed, landscapes can represent the nation, and give both political and cultural interpretations
283 of an identity (Mitchell, 2009).

284

285 4. Discussion

286

287 "The history of climate and culture may be understood as a developing series of conjuncture relationships of great
288 complexity" (Fischer, 1980, p.246). Thus, we need to be very careful when analysing both fine arts and written
289 documents. Neither images, nor documents are a true depiction of reality. Painters choose what they would like to
290 paint, according to both aesthetic criteria, and to the market of Art. In the same way, weather enthusiasts only give
291 little information about the weather and climatic elements. This explains why the written sources are full of
292 uncertainties. We have used Fabricius' notebook - described in Buisman's book - to categorize different kinds of
293 winter weather. Yet, it is very difficult to estimate what Fabricius meant by a "frost day". We have to make with
294 the available written texts, and can nonetheless suppose the visible marker of frost was the solidification of water
295 into ice.

296 By surveying a corpus of paintings and documents, our quantitative methodology tried to overpass such an absence
297 of exhaustivity. Of course, each corpus - and ours is small - is a scientific construction, and could have been very
298 different. Moreover, we have considered the paintings as "realistic" depictions of the landscapes. To do so was
299 necessary to examine, in more details, the climatic elements. Yet, it doesn't mean some messages and symbols in
300 the paintings are not present or important, as some researchers have argued (Bruyn, 1995). On the contrary, we
301 agree with the art historians aptly willing to open the interpretations (Buijsen et al., 1993; Sluijter, 1991). The



302 climatic views on these art masterpieces follow such a recommendation, which enables to discuss the degree of
303 (climatic) reality provided by the paintings. Thus, “It appears that pictorial content (...) is not something which is
304 inherently fixed in the image but consists of a « field » of semantic potential which is « triggered » by the image
305 as well as by the expectations and experiences of the audience” (Falkenburg and Finney, 1999, p.353). If a great
306 number of winter landscapes were painted, it is also because the Dutch wanted to acquire the paintings, and place
307 them into their interiors. The public wanted to keep such an imagery at sight.
308 If only the paintings had been analysed, our knowledge of past winters during the LIA would be too specific, and
309 thus, incorrect: “In some respects, contemporary Dutch winter landscapes are a uniquely problematic source for
310 cultural historians of climate change, despite their seemingly obvious connection to the Little Ice Age” (Degroot,
311 2014, p.457). Therefore, we disagree with the statement according to which “even if they are not necessarily
312 indicatives of cold climate, the effects of these winters are well represented in historical paintings, e.g. in « Winter
313 landscape with skaters », by Hendrick Avercamp” (Diodato and Bellocchi, 2012). The written documents also
314 mention cases of people who died of the cold, passed through the ice, and cases of plague during the Golden Age
315 (Buisman and Engelen, 2000). In some proverbs, the ice is depicted as something both enjoyable and dangerous
316 (Straaten, 1977). At least in Avercamp and some of his contemporaries’ paintings, there is no such an image of
317 winter bringing death (cf. fig. 4). However, some other paintings represent a less enjoyable image of winter. Hence,
318 it would be very interesting to understand why it is Avercamp’s winter landscapes “which, four hundred years on,
319 still govern our image of the cold winters of the seventeenth century” (Roelofs, 2009, p.83).
320



321
322 Figure 4: Hendrick Avercamp, Winter Landscape with Ice skaters, 1608, Art Museums of Bergen, oil.
323 [https://commons.wikimedia.org/wiki/File:Winter_Landscape_with_Ice_Skaters_by_Hendrick_Avercamp,_Berg](https://commons.wikimedia.org/wiki/File:Winter_Landscape_with_Ice_Skaters_by_Hendrick_Avercamp,_Bergen_Kunstmuseum.JPG)
324 [en_Kunstmuseum.JPG](https://commons.wikimedia.org/wiki/File:Winter_Landscape_with_Ice_Skaters_by_Hendrick_Avercamp,_Bergen_Kunstmuseum.JPG)
325
326 Is it because nowadays, we are used to seeing people enjoying the ice? Or, is it because these paintings remain
327 national images of the Netherlands? Like the majority of Dutch painters, Avercamp represented the ice, and



328 skating. Undoubtedly, skating remains today an essential component of the Dutch identity. The Dutch skaters often
329 reach the top position in the Olympic games, whereas despite climate change, the Elfstedentocht (which last took
330 place in 1997) is still an emblematic challenge.
331 The winter landscapes fashion probably resulted from a combination of climatic, political, social, and religious
332 facts. The four hypotheses we have discussed are imbricated. However, the winter landscape genre also exists
333 because of other factors. After a blooming period of winter scenes, the painters decided to change their themes
334 (Robinson, 2005). Moreover, shortly after the 1670 decade, the Golden Age ended up (Denys and Paresys, 2016;
335 Prak, 2009), the market of art declined, and many painters died – e.g. Jacob van Ruisdael in 1682. Though the end
336 of the 17th century was one of the coldest phases during the LIA, with the Maunder minimum (Diodato and
337 Bellocchi, 2012; Wanner et al., 1995), winter landscape paintings were neglected.

338

339 5. Conclusion

340

341 Winter landscapes during the Dutch Golden Age represent certain kinds of weather. They do not make a reliable
342 source for climatic data. Yet, they stand as testimonies of severe winters, and show the societies' adaptation to
343 certain cold conditions. Moreover, they inform us about the cultural depictions -and related choices- of weather,
344 and by extension, of climate. The painters have created a "picture" of winter. The paintings are not only images,
345 as their authors have created a highly partial and sketchy imagery of -a period during- the LIA. Thus, to better
346 understand the climatic images and imageries of societies, interdisciplinary approaches between the history of art,
347 the history of climate, and climatology, need to be extended. This remains an area that requires further
348 investigation.

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