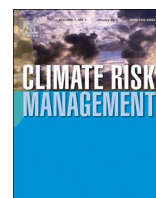


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Portrait of a climate city: How climate change is emerging as a risk in Bergen, Norway



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ABSTRACT

Climate change is dramatically shifting the way cities interpret and live with their local climate. This paper analyses how climate change is emerging as a matter of concern in the public spheres of Bergen, and interprets how this concern is affecting Bergen's identity, with implications for the city's climate risk governance. Historically, Bergen has a strong identity as Europe's rainiest city, manifested in its cultural and social life. In the past 15 years, Bergen's identity has been shifting from a 'weather city' to a 'climate city'. This paper draws on ethnographic research, interviews and document analysis to map this shift as co-produced by certain social and natural events and processes; told as narratives of change. This identity shift is creating surprising hybrid representations of climate that are locally meaningful, shaped as much by Bergen's cultural weatherworld as by incoming ideas of climate change. These representations influence Bergen's attitudes towards climate risk governance, and may extend influence to global scales via climate city networks. This identity shift also moves the timeframe of risk governance. As a weather city, risks were implicit to the city's heritage and peoples' lived experience. But as a climate city, risks are predicted, to foresee and prevent impacts. Critically employing co-production as an analytical lens can help us understand the multiple facets to cities' climate risk governance, including the role of culture and identity.

1. Introduction

On a wet afternoon on the 14th March 2019, hundreds of young school strikers gather together under a sea of umbrellas in Bergen centre's main shopping street Torgallmenningen to protest against climate change. The online event «Streik og demonstrasjon for klimaet!», with over 4500 interested Facebook's users, has been coordinated by a collective of local NGOs and is led by 'Klimaoppørret i Bergen'. Sixteen-year-old Tobias¹ has come to "have [his] voice heard" about something which he feels is completely out of his control and yet which dictates his future. On the stage, young musicians rap about the environment in Norwegian and folk songs are sung in unison with the crowd. The

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setting is distinctly Bergenser, but the focus on a globalised phenomenon is clear: placards display internationally recognisable slogans in English such as “there is no planet b”; proud selfies are photographed and shared on Snap Chat and Instagram; protesters wearing Anonymous masks, the infamous international hacktivist group, call for people to “go vegan”; photos of whale corpses with plastic-filled guts are sellotaped to cardboard. The idea of climate change takes root in Bergen.

Global climate change is influencing the way we understand and govern the places we live (Jasanoff, 2010; Miller, 2004), and it is becoming an important matter of concern in the public spheres of Bergen, a city in the west coast fjords of Norway (Dannevig et al., 2013; Groven, 2013). Bergensers are talking about what a changing climate might mean for their city, and what their share of responsibility for tackling global environmental change might be, with their talk being translated into concrete actions in public spheres. In 2019, while school students strike, we concurrently see electoral debates on road tolls for reducing traffic and emissions, climate music and film festivals, local businesses calculating their emissions, community garden projects and a newspaper running daily climate articles. Taken together, we argue that ideas of climate change are pervasively reshaping Bergen’s urban design, public narratives, cultural identity, institutions and governance; transforming it into a ‘climate city’. In this way, Bergen is joining a growing number of cities worldwide that are assuming a lead role in climate risk governance (Wardেকker et al., 2010; Webb, 2016; Ilgen et al., 2019). As cities like Bergen become hubs in a globalised network they redefine themselves according to global concerns (O’Brien and Leichenko, 2000), becoming global climate governance actors.

This paper aims to: (a) *analyse* how climate change is emerging as a matter of concern in Bergen’s culturally-mediated public spheres; and (b) *interpret* how this concern is effecting Bergen’s identity, with implications for the city’s climate risk governance. Bergen is a revealing case because its historic identity as the wettest city in Europe has nurtured strong cultural ideas and practices toward weather (Dahl and Bagge, 2015; Meze-Hausken, 2007). And at the same time, Norway is a major oil and gas producer, and Bergen hosts many of the enterprises developing offshore oil extraction. Studying Bergen thus provides interesting observations of the unique and sometimes surprising local expressions of global climate change. Specifically, we show that the changing narratives in Bergen are not primarily related to the oil industry, but a shift in narrative and identity of Bergen as a ‘weather city’ to being a ‘climate city’. We structure our analysis by the idiom of ‘co-production’ (Jasanoff, 2004), which focuses on the social processes converging in Bergen’s public spheres to produce and stabilise concern for climate change. We illuminate these processes through focusing on narratives; we analyse the narratives of change that accompany social processes and combine in public spheres.

This paper highlights multiple facets of climate risk governance, with a focus on the role of culture and identity. While much research focuses on risk management within the formal apparatus of government (Bisaro et al., 2018; Moser and Eckstrom, 2010; van den Belt et al., 2010), we take an encompassing view of governance settings; understanding governance as the sum of actions across various public spheres according to different configurations of politics, polity (institutions) and policy (Lange et al., 2013). We particularly highlight the pervasive influence of culture traversing and binding these settings (Adger et al., 2013), and we show how culture shapes the perception of climate change and the resulting activities (von Storch and Krauß, 2006). Section 2 starts by outlining the concepts and methods deployed for this research, before Section 3 describes Bergen’s extant cultural identity as a ‘weather city’. Section 4 gives an account of climate change’s emergence as a matter of concern in Bergen, and Section 5 discusses the implications of the transformation of Bergen into a ‘climate city’.

2. Concepts and methods

2.1. The conceptual framing

This article builds on previous research on climate action in Bergen. Political and policy scientists (Aall et al., 2007; Dannevig et al., 2013; Groven et al., 2012; Groven, 2013; Ryghaug, 2011; Ryghaug et al., 2011) have studied the factors that have given climate change ‘cognitive as well as political standing’ in Bergen municipality and media. Sociologists (Nilsen, 1999) and geographers (Meze-Hausken, 2007) have looked at how climate narratives in local media, and amongst Bergen’s young people, have emotionally affected people. Our study has a distinct conceptual approach and focuses on *the various ways that climate change enters the Bergen public sphere, confronts the extant cultural context (Jasanoff, 2004), and becomes stable and powerful as a matter of concern*. Four concepts are important here.

First, we define our study by a holistic attention to Bergen as a ‘place’, an extant cultural context, encompassing diverse public spheres; from local government meetings to festivals and protests, schools and writing groups. For us public spheres are governance settings of social interaction and action, configured from politics, policy, and institutional frameworks of norms and culture (Lange et al., 2013; Scott, 2014). This focus recognises that while public debate and action take different forms in different spheres, there are some cultural strands of identity that bind these spheres, and weather is one such strand. Weather is an important backdrop to Bergensers’ shared memories, identity, notion of place, cognitive scripts, and emotional and social attachment to the city (Hidalgo and Hernandez, 2001; Lewicka, 2010). Taking Ingold’s concept of ‘weather-worlds’, the human condition is arguably embedded in weather (Ingold, 2010:132–133) as an unescapable part of human experience and perception. Hence, changing local weather conditions also imply a number of social changes, of everyday life routines and rhythms, and changes in how a place is perceived. Bergensers’ ‘weather practices’ are tied to self-perceived resilience and provide a coordinate for interpreting Bergen’s future climatic change.

Second, we focus on how climate change ideas enter and become ‘matters of concern’ within Bergen’s public spheres. In this we draw on Latour’s work to make apparent the ways that scientific ‘matters of fact’ like climate change are bound to wider social and political interests; associated with “highly complex, historically situated, richly diverse matters of concern” (Latour, 2004: 237). Facts

are about, and are in themselves, things that society care and worry about; things that matter. To properly consider a scientific fact is thus to recognise it as 'living' in a social context, with agency to influence political decisions, and with value for some people (de la Bellacasa, 2011). Far from weakening their legitimacy, Latour and others argue that "to exhibit the concerns that attach and hold together matters of fact is to enrich and affirm their reality" (de la Bellacasa, 2011: 89).

Third, we employ concepts of 'co-production' to look at the dynamic processes by which climate change ideas take hold in Bergen and are appropriated in local public spheres. Specifically, we draw on STS traditions of co-production as a 'descriptive' lens for interpreting shifting relationships between science, society and nature in the city (Bremer and Meisch, 2017; Bremer et al., 2019; Jasanoff, 2004; Webb, 2016). 'Constitutively,' co-production makes visible the ideas that help communities understand their place in nature; how their view of nature steers social life, and simultaneously, how social life orients their view of nature (Jasanoff, 2004). Miller (2004), for instance, shows how global science and governance networks have altered the ways communities signify local climates; from being a place's prevailing weather to a quadrant in a global circulation model. In this way co-production reveals friction between competing ideas of natural order and the "role memories, beliefs, values and ideologies play in sustaining some representations of nature and the social world at the expense of others" (Jasanoff, 2004:14). We can see how climate science is adopted and adapted (Callon, 2004) to what Jasanoff terms the "backdrop of an extant order" (Jasanoff, 2004:19). 'Interactionally' co-production is "interested in how science and society make and remake each other in dynamic processes [...] it is about conflicts over different forms of knowledge and over issues of demarcation of science and society, facts and values, or knowledge and power" (Bremer and Meisch, 2017:7). It observes how climate science changes patterns of power and agency in public spheres, at the same time as social context gives impetus and form to climate science.

Fourth, we draw on narrative analysis as a method of observing and making sense of the processes converging in and co-producing concern in public spheres, in written texts and interviews. We employed narrative as both an interview technique – for eliciting peoples' perspectives in a narrative format and workshops – and as an analytical template to impose on texts (Bremer et al., 2017; Fløttum and Gjerstad, 2017). We define narratives as stories that set a sequence and order to events occurring in a defined place and time, in a plot that supposes causality and infers a moral or emotional response (Bremer et al., 2017). As 'storied animals', arguably we all individually use narratives as a mental framework for making sense of a confusing world on one hand (Bruner, 1991), and communicating and constructing meaning on the other (Bal, 1997). We chose to elicit and analyse narratives because they can help make explicit those things that are tacit within a place; how people culturally relate to their environment and ascribe meaning through stories' morals (Bremer et al., 2017; Bremer and Funtowicz, 2015). A narrative focus shows how individuals' stories are both steered by, and constitutive of, public narratives of identity and place. Through peoples' narratives we observe the ways climate change ideas come to change public narratives of climate in Bergen.

2.2. Research methods

Our broad and shallow study focused on the processes coming together in Bergen's public spheres to create climate concern. This demanded a mixed-method ethnographic approach that tied together diverse sources of (predominantly narrative) evidence of these processes, which converge in a triangulation fashion to indicate and infer relationships between climate concerns in Bergen, rather than precisely demonstrating these relationships as 'deep' research of one sphere could do. We stop at building a case for Bergen as a 'climate city'. In building such a holistic picture we saw that almost all the people we spoke to, with the exception of one planner, discussed climate mitigation and adaptation as intertwined; they did not draw a clear distinction. Our multi-faceted approach suggested that many groups' and institutions' understandings of climate responses traverse existing administrative adaptation/mitigation silos, though this deserves further research.

We conducted various research activities over 2018/2019 (Krauß et al., 2018a, 2018b, 2019), including (a) reviewing relevant scientific studies and literature related to Bergen; (b) studying non-scientific literature including government policy; tourism websites and brochures; public information booklets and websites; books about Bergen's residents like biographies, histories or photo montages; and Bergens Tidene newspaper archives; (c) observations of public spaces and events in the city; (d) a series of 19 interviews with actors in different public spheres in early 2018 (see Table 1); and (e) a scenario workshop in November 2018 with 18 participants discussing how Bergen could be resilient to climatic change in 2050 (see Table 1).

The interviews were designed to elicit narratives revealing processes generating climate concern in public spheres. They were semi-structured episodal narrative interviews, structured around eight open questions which encouraged story-telling, both about actual experiences – 'Describe Bergen's seasons and what they mean for you personally and in your work life' or 'can you tell me about a weather event that stands out for you?' – and invented scenarios – 'imagine telling a stranger about Bergen'. Interviews were conducted in Norwegian or English, in locations chosen by interviewees, and were recorded and transcribed with the interviewee sent the transcript. Resource limitations and the nature of this research limited us to 15–20 interviews, though given the tight networks in Bergen, a small number of interviews provided a comprehensive picture. Interviewees were chosen by three criteria. First, we distinguished between actors 'inside' climate governance networks and spheres in Bergen (e.g. local government planners, consultants, scientists), and actors 'outside' these networks, who have a strong interest in Bergen's climate but a weaker role in formal governance, and sought a balance between these two groups. Here we privileged: (a) a grass-roots perspective (ie. from local NGOs) and (b) a culturally thick perspective (Geertz, 1973), given our attention to how Bergen's culture and identity is (re)framed by climate (i.e. artists, authors, filmmakers). Second, there was attention to gender balance, and third, to an intergenerational spread of views; including two retirees, a student, and professionals at various stages of their careers.

Subsequent to the interviews, we ran a scenario workshop in November 2018, asking participants to use the interview findings in building scenarios of a resilient Bergen in 2050. We sought visions for Bergen's future anchored in its current features, culture and

Table 1

Interviewees and workshop participants.

Narrative interview participants (19)	Workshop participants (18)
Planner at Vestland County council (m)	Planner at Vestland County council (m)
Member of NGO 'Climate = Health' (f)	Member of NGO 'Climate = Health' (f)
Climate researcher at a research institute (m)	Climate researcher at a research institute (m)
Architect at a consultancy (m)	Architect at a consultancy (m)
Member of 'Grandparents for Climate Action' (f)	Member of 'Grandparents for Climate Action' (f)
Planner at Vestland County Governor office (f)	Planner at Vestland County Governor office (f)
Friends of Bryggen board member (m)	Planner at Bergen municipality (m)
Author active at the Bergen Literature House (f)	Climate researcher at a research institute (f)
Journalist at a local newspaper (m)	Member of NGO 'Climate = Health' (f)
Planner at Bergen municipality (f)	Member of NGO 'Friends of the Earth' (f)
Social scientist at the University of Bergen (m)	Retiree running writing groups with retirees (m)
Local freelance film-maker (m)	Librarian in a Bergen public library (f)
Curator at a local art centre (m)	Advisor at the Norwegian Climate Foundation (f)
Employees at Norwegian Institute for Cultural Heritage Research (Group interview) (m) & (f)	Engineer at the department of clinical medicine, Bergen Hospital (m)
Member of NGO 'Sustainable Lifestyle' (f)	Social scientist at the University of Bergen (f)
Teacher at Bergen Architecture School (m)	Social scientist at the University of Bergen (m)
Engineer at Bergen municipality (f)	Climate scientist from a research institute (m)
Climate researcher at University of Bergen (m)	Planner from Bergen municipality (m)
Former local government politician (f)	

(f) signifies female participants, (m) male; participants shaded grey were both interviewed & participated in the workshop. This work was notified to the Norwegian Centre for Research Data. All interviewees providing informed verbal consent, and all workshop participants informed written consent to use their transcribed talk, where they are anonymously identified by a descriptor.

identity. As for the interviews, participants were chosen to reflect key actors in Bergen's climate governance network but also include actors in other public spheres, while emphasizing a diversity of ages and genders. We ended up with more researchers (5/18) than in the interviews, because of interest from a research centre active in Bergen's climate governance. We purposely designed the workshop with a third of participants from the pool of narrative interviewees (Table 1) to strengthen the link between the interviews and the workshop, provide depth to the scenario work with people who have already reflected on visions, and extend the network of people engaged by the project. It was a balance between going deeper with a small group and admitting a broader group of fresh perspectives. Participants were divided into three groups of six, each facilitated by a social scientist (not listed in Table 1). In this paper, we draw on the findings of the first workshop activity. Participant groups were randomly allocated broad scenarios for 'Bergen in 2050' and asked to build a more detailed scenario that they endorsed, by adding five 'dimensions' selected from a set of 16 cards. The dimensions were distilled from the interview question, 'what is your vision for Bergen in the future?' and captured elements of Bergen as a place that interviewees wanted enhanced or changed. Groups debated which dimensions to add and could amend dimensions as they wished. Looking at the dimensions chosen reveals the narrative, identity and place-making devices emerging most strongly in the workshop debate. Overall, we validated the interview findings, which may not be surprising given interviewees constituted a third of participants.

2.3. Analytical framework

Our analysis described the emergence of climate concern in Bergen's public spheres by studying the interaction of two social phenomena (see Section 2.1): (a) the extant ways that weather and climate feature in social structures framing public spheres, where we adopted a pragmatic and encompassing idea of structures as discourses, public narratives, institutionalised knowledge, cultural practices and governance norms; (b) the processes by which climate change concern enters public spheres, takes hold and effects these structures. To study these structures and processes, we analyse five sources of data: (i) observations; (ii) public documents; (iii) interview transcripts; (iv) workshop exercises; and (v) scientific literature. Data (i)-(iv) we analysed according to a hermeneutic

approach to narrative analysis (Czarniawska, 2004); interested in how people use stories to impart meaning, a moral, emotion or concern, over other features of narratives, like their structural elements (Fløttum and Gjerstad, 2017). Narrative meanings were coded according to (a) structures and (b) processes, and scientific literature drawn on to strengthen arguments about the processes bringing climate concern. Three factors render this a robust analysis. First, the analysis triangulates across multiple sources of reinforcing evidence (see Sections 3 and 4). Second, the analysis of data (i)-(iii) was validated in group discussions in the scenario workshop. And third, by mapping our findings onto published scientific work, we demonstrate congruence with previous studies.

3. A weather city behind us: Weather framing Bergen's public spheres

3.1. Bergen city

Bergen has a long-standing identity as a 'city of weather' (Bergen Kommune, 2018; Dahl and Bagge, 2015; Meze-Hausken, 2007), and is arguably 'full' of weather representations, understandings and practices, wherein ideas of climate change must find their fit. This section uncovers the extant weather framings underpinning public spheres, using our empirical work.

Bergen is a harbour city in the fjords of Western Norway. Founded in 1070, Bergen means 'the green meadow among the mountains', and has long been an administrative and trading centre, particularly tied to the trade of fish and dried cod. From the mid-14th to mid-18th centuries, Bergen was one of the most important towns in the Hanseatic League – a confederation of German merchant guilds – making it the largest city in Norway up until the 1830s. It is an international city, with influences from trade with England, the Netherlands, Germany and France. Today, Bergen is a municipality and administrative centre of Vestland County, and had a population in 2016 of 278,121 inhabitants (Statistics Norway, 2019), spreading over the surrounding valleys and islands. The city is portrayed in public documents (e.g. Wikipedia page, Municipality's 'The City is Bergen' pamphlet, tourism publications) along four key themes (Krauß et al., 2018a): (i) Norway's busiest freight and passenger port and marine industry hub; (ii) centre for higher education and research; (iii) centre of culture and heritage (e.g. the Bryggen UNESCO world heritage site), and (iv) a nature hub ('gateway to the fjords').

The physical geography of Bergen provides a dramatic natural setting for the narratives that make and remake this place. Much is made of the city being 'nested' in the bowl formed by seven forested mountains and the fjord, and how it funnels the westerly weather fronts over Bergen. This relationship is historically captured in observations from Bergen-born Norwegian-Danish 18th century author and historian Ludvig Holberg (Dahl and Bagge, 2015) and iconic paintings (e.g. J. C. Dahl's 'Bergen's Harbour', painted in 1834). More recently, various promotional material links Bergen's weather to its 'geographical situation'. The municipality's 'The City is Bergen' publication (Bergen Kommune, 2018), describes how the mountains capture the weather, and are in turn shaped by the weather, noting: 'Bergen is a city with a dramatic landscape, and due to heavy rainfall, the spring is especially colourful and beautiful here' (Bergen Kommune, 2018: 8–9).

3.2. Wet to be a Bergenser: Rain and resilience as an identity

Local identity is built on Bergen's rain. Article titles in local newspapers often refer to the rain (Meze-Hausken, 2007), with one 1970s Bergens Tidende title proclaiming that it is '[w]et to be a Bergenser'. Bergen municipality's 'The City is Bergen' publication characterises Bergen as 'A City of Weather', noting that Bergen's mountains make it 'susceptible to rain' but that local people are 'more than accustomed to this fact' (Bergen Kommune, 2018). This theme of weather-resilient Bergensers, outdoors in all weather, is an often-repeated public narrative. The Fjord Norway booklet says 'with the forces of nature ever present, it's only natural that the people of the region are active and like to spend their leisure time in the great outdoors.' (Fjord Norway, 2017:25). A widely sold photo anthology of Bergen (Haraldsen, 2017:241) has a section on Bergen as 'The rain city' ('Regnbyen'), and asserts; 'Bergensers are well adapted to weather conditions, and are not likely to hide scared indoors'.

Bergen's rain city identity has also become an important commercial and artistic symbol around the city, such as the Hansa brewery trucks, which display the slogan 'Brewed in the rain'; local shops with names like 'Rain'; sculptures that interact with rainwater, channeling it or causing it to steam; posters of the Philharmonic Orchestra showing the musicians holding umbrellas; or postcards of school children in the rain (for photos, see Krauß et al., 2018a).

Most people interviewed agreed that Bergen's rain is identity, with interviewee 4 noting, "I think that it's a self-enforcing awareness: the more people talk about it, the more it becomes sort of a stamp". Again, themes of 'built-in' resilience and adaptation were invoked; calling Bergen a place where people "always have wet weather clothing with them" (Int. 13), with two respondents saying the rain hardens local people; "it is embarrassing to not be able to handle the rain in Bergen" (Int. 16). But some voiced resentment about a negative stigma attached to Bergen's weather. One interviewee (Int. 11) said, "[the rain] is not the first thing I want to emphasise [...] rain is one part of the identity."

3.3. Weather in local histories and narratives

Weather features as a setting and an agent in public and private narratives that together create a sense of place, including in local books. Weather and seasons create the setting for peoples' memories; whether swimming in the fjords in summer, 'shivering and freezing' in winter's snow caves, or leading the local 'buekorps' marching bands in the 'wet and cold' (Bernitzen, 2016; Dahl and Bagge, 2015; Rafto and Rafto, 2017). In some stories, weather plays a central role. For instance, in Arne Birger Lindtner Næss's biography, he recounts, "It rained terribly at the Scout camp in 1960 [...] and the rain dripped into the tents where we sat and ate

Sunda on slices of bread” (Berntzen, 2016: 20). Dag Arnesen talked about repairing the drums in his marching band troop: “in rainy weather the leather became slack, but now they use water resistant plastic” (Berntzen, 2016: 35). Here again rain creates the drama, the complication, and adaptation is the moral.

Our interviews elicited a rich corpus of weather stories, often punctuated by dramatic weather events. One common story is of being saturated in torrential downpours and street flooding (Int. 2, 3, 4, 8, 10 & 18). Another common story is about stormy winds (Int. 2, 5, 9, 11 & 14); sitting inside and watching trees battered and tiles ripped from roofs. One interviewee (Int. 9) said he is still cutting up trees blown over on his land by the Nina storm four years ago. Two interviewees (11 & 15) told of their experiences with storm tides, how they would flow over the old harbour walls and wash through Bryggen. Other times the weather is attributed a magical quality. For instance, two interviewees talked about skiing in Bergen’s mountains on clear winter nights, with the city’s lights below and the stars above.

3.4. *Weather as natural and social rhythms: Seasons in Bergen*

Seasons provide an important device for presenting the different faces of Bergen, and for situating different narratives at points in the intertwined *natural* and *social* rhythms of the city. Seasons are both cognitive scripts of expected conditions for planning activities, and a source of strongly shared emotional attachment. Our interviews, and other research (Meze-Hausken, 2007; p. 21), indicated that Bergengers have a clear idea of the natural phenomena contained within each local season. As one interviewee described Bergen’s particular seasons, “here it’s full on: it’s full on winter, it’s full on summer” (Int. 10). The explosive onset of spring is talked about: “It’s beautiful in this part of Norway when there is sun because it’s so wet over the rest of the year. Look at the difference in May in the East of Norway and in the west [...] It’s two different colour spectrums” (Int. 11).

In parallel with these natural rhythms are the social rhythms discussed by interviewees. The farming community around Bergen is guided by planting and harvesting seasons (Int. 2). The cultural calendar is most full in Spring, with concerts and festivals in May and June (Int. 4). Summer (July) is the holiday season, when Bergengers travel to their cabins or on a ‘syden’ (southward) trip to ‘find summer’ in Mediterranean climes (Int. 14). Autumn, in October/November is a time for keeping ‘cosy’ indoors and watching films (Ints. 3 and 14). December is the season of Christmas parties (Int. 2), and winter brings the ski season (Int. 7). Seasons are also punctuated by festivals, with normal weather judged according to expectations for those days. Interviewee 1 remembers his surprise at parading around 1958 on Norway’s national day, the 17th of May, when it began to snow; “I think that was the biggest weather shock I ever got”, he said. Meze-Hausken’s (2007: p. 20) analysis of Bergens Tidene also found that Bergengers have a clear idea of what seasonal categories contain, noting that “Seasonal issues receive by far the most attention on [the] news [...] outdoor activities according to seasons or hopes for weather conditions expected for a season.”

3.5. *Weather as practice and ritual*

Local *weather practices* are important; Bergen’s identity is performed through numerous place-specific proverbs, practices and rituals/events. One example is the fetishism around the umbrella, which is celebrated every year in Bergen on national umbrella day. Historically, there has been an important trade in umbrellas (Berntzen, 2016), and in group interview 11, interviewees joked about the number of mangled umbrellas that can be found jettisoned around the city, and a culture of ‘communal umbrella ownership’, referring to the umbrellas forgotten in public places and picked up by others. Another example is rain-clothing, which has traditionally been remarkable to Bergen (Dahl and Bagge, 2015), and best summarized in a statement by a local raincoat company, BRGN (2019), on its website: “We live in one of the rainiest cities in the world. When it comes to rain you’ve got nothing on us. This is Bergen. This is where we live. This is who we are. We won’t let the weather dictate: what to do, where to go, when to go...”

Another important Bergen tradition relates to water management, particularly reducing flooding by the swift piping away of stormwater (Dahl and Bagge, 2015). A Bergen pamphlet tells how the challenges of living with rainfall have built expertise in water and sewage management, noting “The water works in Bergen are the oldest in Norway, and Bergen has a total of 1900 km of water and sewage pipes” (Bergen Kommune, 2018, pg. 9). A tight coupling of Bergen’s climate and its stormwater management was explicitly made in interviews with a local government planner (Int. 2) and engineer (Int. 16), as a profession and craft of building the city for the local (current and future) rainy conditions.

Bergen is also a birthplace of modern meteorology, and weather measurement reinforces its identity. Interviewee 17 noted that the predictable westward approach of weather fronts led pioneer scientists like Bjerknæs to better understand frontal systems, and to establish the Bergen School of Meteorology to further this science. Bergen meteorologists and climate scientists continue to be world leaders in understanding ocean/atmospheric interactions; their practices and technologies part of the city’s identity. At the same time, other more wide-spread traditional Norwegian technologies still feature in public discourse of weather like the primstav, a wooden calendar that marks the seasons and yearly events. An article in Bergen Avisen in April 2018 announces that the primstav ‘brings good news and promises a great summer’ (Røssland, 2018).

3.6. *Resilience in local government*

Local governance is also founded in living with Bergen’s weather. Six interviewees talked about Bergen local government as resilient, with a long history of adaptation to climate variability. One county level planner (Int. 18) said: “[s]o, if we are going to talk to adapting, I have to say that I have faith in Bergen, in that they take [climate adaptation] seriously and have been doing it for a long time already”. Another planner (Int. 2) saw this resilience physically manifested in the water and sewage system (see 3.5 above), and

practically in the system's planning, building and maintenance, saying, “[i]f you talk to the leading people on water and sewage system in Bergen, they have been talking about [climate adaptation] for years and now they are developing a plan for the overall water system. I think the competence and capacity in Bergen is where it should be”.

4. A climate city ahead: Processes creating climate concern

By analyzing narratives of change in the following, we can identify several natural and social processes that converge in Bergen's public spheres, reinforce each other, and interact to co-produce and stabilize concern for climate change (Bremer and Meisch, 2017; Jasanoff, 2004). The mutual significance of these intertwined processes and how they together constitute concern is important; unlike some other analyses (Dannevig et al., 2013) which seek to rank 'drivers', we assert no one process alone can account for climate concern. We assemble evidence of seven interacting processes, drawing on our empirical findings and invoking other scientific literature; both to check our results against other studies, and appeal to these studies as sources of evidence themselves. Our analysis discerns a cluster of events – particularly between 2000 and 2010 (see Sections 4.1–4.7) – which sketch a history of this concern and how these processes enter the Bergen context. It is also important to reflect that our interpreting these events and public narratives creates a new, synthetic narrative that consolidates different stories of different times into a unitary whole. A final challenge for this analysis is to delineate Bergen, distinguish the influences of climate change in Bergen as distinct from elsewhere, since there is a porous boundary between Bergen and the world.

Norway has had fluctuating levels of climate concern, ranging from 40% claiming to be very worried in the 1980s, to only 10% expressing this concern in the 1990s, only to rebound in 2016 to 29% saying they are very worried (Steenjtes et al., 2017; Norgaard, 2011; Sygna et al., 2004). Importantly, a national survey in 2016 found 93% of respondents thought climate change is happening, with about two thirds saying that Norwegians themselves are already being affected by this change (Steenjtes et al., 2017). There are fewer published studies of climate concern specific to Bergen or its hinterland, and those we found focus on young people, and align with the national trends above, though not with any significance. We get glimpses of apparent denial around the turn of the century, with Nilsen (1999: 190) interviewing Bergen students in the late 1990s who said they saw climate change as a problem distant in time and space; “like nightmares disappear and seem distant in the light of day”. Around the same time, Norgaard (2006b: 357), in her study of a western Norwegian city, saw young people deliberately deny climate change, “we live in one way and we think [about climate change] in another”. But by 2016, Fløttum and colleagues (2016) found climate to be a real and growing concern for Bergen school students, enough to motivate school strikes by 2019. What might be motivating this shift in concern?

4.1. Natural processes

Extreme natural events and perceived changes to seasons are associated with climate change and used to voice concern. The most discussed events (in our interviews and document analysis – see also Dannevig et al., 2013) are the landslides of 2005. In September 2005, torrential rains triggered a landslide in the Hatlestad suburb that killed 3 people, and in November that year another person was killed by a rain-triggered landslide in Hatlebakken. One interviewee (Int. 11) lived in Hatlestad and remembers being woken by his neighbor in the early morning and seeing the flashing lights of the emergency services through the dark rain. For many (Int. 6, 7, 9, 11, 16 & 17) these landslides sparked the public and political awareness of local impacts of climate change. Studies by Dannevig et al. (2013) and Groven (2013) saw these ‘focusing events’ as central to putting climate adaptation on Bergen's political agenda. We see these landslides referred to in policy documents like the ‘Water and the life of the city’ (Bergen Kommune, 2010): “Following the landslide disaster at Hatlestad Terrace, the City of Bergen has put a lot of effort into mapping all areas with a risk of landslides”.

Another event connected to climate change in Bergen was the discovery of a dying whale in February 2017, washed up on Sotra island south of Bergen with its stomach full of plastic bags. While the link may not be direct, interviewees (1 & 13) recounted this whale story as a symptom of our more pervasive disregard for our natural environment, with climate change another symptom. At the school strike in 2019, some students held placards showing photos of dead whales full of plastic, again showing this recurring link between climate and wider environmental issues.

Among interviewees, the seasons are changing as a backdrop to their stories, with this departure from the norm often attributed to climate change; what Dannevig and colleagues (2013) term ‘real-world indicators’. Interviewees (3, 5, 7, 9, 14, & 17) invoked the cold, snowy winters of 2010/2011 and in 2017/2018 to lament their increasing exceptionality. This same story was told by climate scientists (Int. 7 and 17), who also read these changes in the statistics. “So what I definitely experienced since I was little is that the winters have become warmer [...] and I also see this in the numbers.” Snow sports and play are central to Bergengers' culture, regularly appearing in public narratives, and their loss marks a stark change. Changing farming seasons around Bergen are also discussed. In a presentation to policy-makers in January 2018, a Bergen-focused climate scientist noted, “Now spring is coming earlier, meaning it rains earlier, and as a result it is difficult to use heavy machinery on the fields” (Kolstad and Neby, 2018). Even fine weather is coming to be met with suspicion. Interviewees 14 and 16 talked about the long dry May of 2018, but tempered their enthusiasm by seeing it as portentous of more sinister climate change.

In the scenario workshop, participants saw that climatic and natural processes would shape the city, and argued a resilient city would be synchronized to these processes. Two groups depicted Bergen in 2050 as ‘A city linked to nature’, and the third group emphasized Bergen's green spaces. They saw future Bergengers as close to nature, and depicted this as their in-built resilience, with all three groups emphasizing outdoor lifestyles.

4.2. Science

We can map two parallel ways that climate science has been influential in formulating concern for climate risks in Bergen. On one hand, we see a series of published vulnerability and impact studies, conducted at CICERO (Centre for International Climate and Environmental Research) from 2000 to 2004, which challenged ideas of Norway as resilient by showing that some local places are more vulnerable than others (O'Brien et al., 2004; Sygna et al., 2004). These reports showed that Norway's west coast is already facing increased rainfall, particularly intense precipitation events, and high wind storms. And they portrayed Vestland as 'highly exposed', with projected increases of 25% more rainfall, particularly in extreme events. The map of increases in autumn rainfall (Sygna et al., 2004; Fig. 3) targeted Bergen like a bullseye. Moreover, they suggested that the wettest areas on the west coast, may see 100–1100 mm/year additional runoff, translating to flooding and landslides (Sygna et al., 2004). Meze-Hausken (2007) discusses how reports like these appeared prominently in Bergen's media, 'capturing journalists' attention'.

On the other hand, we see how climate science has increased in importance in Bergen's research community. Bergen meteorological and climate scientists are assuming an ever-more significant role in understanding global climate change and in 2003 this was recognized by the creation of the prestigious Bjerknnes Centre of Excellence. Since then the Bjerknnes Centre has grown from around 30 scientists to more than 220, from 38 different countries (Paasche et al., 2017). These scientists contribute to international assessments by the Intergovernmental Panel on Climate Change (IPCC), and have developed one of the most-used models of ocean-ice-atmospheric interactions in the world (NorESM). More recently, 'Climate and Energy Transitions' is one of three priority areas at the University of Bergen, and there are efforts toward a Bergen Climate Hub (BACH) across all Bergen's climate research.

The Bjerknnes Centre has increasingly shaped Bergensers' public understanding of climate change, and its projected impacts on Bergen, evidenced by increasing newspaper coverage (Meze-Hausken, 2007), and the increasing solicitation of advice from Bjerknnes scientists to support decision-making by various actors, from local government (Int. 2 and 6), to non-governmental organisations and cultural groups (Int. 5 and 13), or private sector consultants (Int. 12). Both city and county government commit to integrating more climate science into local policy (Dannevig et al., 2013; Groven, 2013). A Bergen municipality presentation in 2017 asserted the city "seeks and contributes to increased knowledge to adapt to changes" (Bergen Kommune, 2017) and listed five international scientific research projects that it has taken part in, including the MARE and BINGO projects. This mirrors work by Ryghaug (2011), that IPCC reports are "a strong stabilizing force concerning climate change knowledge" for Norwegian policy-makers and politicians; providing 'rock solid' and legitimate evidence.

Envisioning Bergen in 2050, all three workshop groups defined it as 'A climate change city'. This was the only dimension used by all three groups in formulating future scenarios, and underlines the importance of climate science to shaping the city.

4.3. Policy

Ideas of climate change have transformed how Bergen is planned and managed by local government. Fundamentally this is underlain by conflicting governance aspirations. On one hand, Norway presents itself as a global leader in addressing climate change, with active climate policy since the 1980s (Ryghaug, 2011), and the White Paper on Climate Policy noting; "Norway's long-standing prioritization of climate policy and our overall efforts both at home and abroad, gives us credibility as a driving force" (Fløttum and Espeland, 2014). Indeed, two thirds of Norwegians think Norway makes a global difference to climate change (Steentjes et al., 2017). Bergen municipality has been a frontrunner on climate change mitigation; the first Norwegian city to adopt an emission target in 1996, and repeatedly committing themselves to ambitious cuts (Aall et al., 2007; Groven et al., 2012). On the other hand, Norway is a major oil and gas producer, introducing the uncomfortable fact that the emissions cuts in Bergen represent a tiny fraction of the global emissions resulting from burning Norwegian oil.

Bergen municipality's (2016) 'Green Strategy' and Vestland County's 'Climate Plan' both bring a global and future focus, departing from a focus on local weather experience, and emphasising new policy and technological mitigative solutions for global climate change. While most narratives we analysed did not elucidate a clear distinction between adaptation and mitigation approaches, differentiations between the two emerge more clearly within these and other policy documents, and mitigative work is headlined. The Green Strategy notes "Bergen wishes to lead the way towards a sustainable planet and therefore introduces the concept of the 1.5-degree city by 2050. The goal is for the people of Bergen to limit their climate footprint in line with the UN agreement on climate change." These policy documents are behind ambitious initiatives to reduce transport emissions, including through toll-roads. This has provoked public outrage, which in 2019 crystallised into 16.7% of the Bergen municipality vote going to the single issue party 'Peoples Action No to More Road Tolls'. The impact of this mitigative work on how people envision Bergen was also seen in the workshop, with transport an important dimension of scenarios; two groups saw more 'Busses, boats and light-rail', and the third more 'rain-proof walk and cycle ways'. Another technical process seen by all groups to shape the city was a shift to 'safer and smarter buildings', both relative to emissions and efficiency, and as 'weatherproof' or adaptable.

Adaptation has emerged specifically as a matter of concern in recent years. As interviewee 2, a local urban planner, discusses in relation to the growing "momentum" of climate action:

"We need to start focussing more on adaptation issues. I think we have to do that through the planning section, because that's when you decide what to build, how to build, how to intervene when you see that things are not being developed the way they should, because you're not taking into account the expected futures of climate change predictions."

Groven and colleagues (2012; 2013) also describe Bergen as a frontrunner in climate adaptation, formalised in 2007 by the creation of a Climate Section and introducing tools in the Master Plan to require Risk and Vulnerability Assessments and Water

Management Plans in land-use planning; spurred by the fatal landslides in 2005. Since then, the municipality has been engaged in several climate-related research projects, forming close ties with climate research in Bergen (Int. 6), and developed a portfolio of climate-inspired policy instruments. The active policy re-framing of Bergen from a 'weather city' to a 'climate city' is captured in 'Water and the life of the city': "*The 'Rain City' is our trademark, and climate change means that we are facing the challenge of dealing with even more water – both from the sea and from the sky*". Groven et al. (2012: 686) likewise note this shift; "much of the municipality's extreme weather management work was reframed in [a climate] adaptation context." The implication is that Bergen's long experience with the weather is facing limitations as Bergen faces a new regime of climate risks, as noted by a municipality representative in 2017: "*The city has a long tradition in surface water management. The city has managed this rather well so far, but existing water systems are about to reach the limits of their capacity and many systems will have problems in the future due to climate change*" (Paasche et al., 2017).

4.4. Political leadership

Groven et al. (2012) and Dannevig et al. (2013) both emphasise that a shift in political leadership saw an increase in concern for climate change in Bergen municipality. A commissioner was elected between 2003 and 2013 who had a clear focus – "[She] said she had one thing, 'its climate and light-rail' [...and had] the slogan, 'I invite you to change the world from Bergen'" (Int. 19) – and worked toward this along several lines. Within the municipality, she established the climate section; "[The municipality] lifted that whole department of experts up to the top level of the staff [...] because everything had to do with climate" (Int. 19). At the same time she worked to establish links with climate researchers; hosting breakfast meetings with researchers to ask about what is known about Bergen's climate and impacts, "[The municipality] did put aside millions [...] just for climate research [...] and went into the MARE project" (Int. 19). The commissioner's impact can also be read in her forwards to key municipal policy documents around that time, like 'Water and the life of the city' and 'Cities of the future'. There was also a desire to culturally engage with climate issues, with the commissioner establishing the Climate Festival in 2008, which invited artists and film-makers from around the world to come to Bergen; a festival that is ongoing (Int. 19; Int. 6). Around the same time, other local political figures and groups emerged, like the neighbourhood climate-focused group called 'Sustainable Living' (Bærekraftige liv) (see 4.7), who began to work in conjunction with the municipality, and received financial aid from them (Int.14). Several years on, one interviewee noted "Bergen has the potential to be a transformative force, and there are politicians now that would gladly be the leading stars of this" (Int. 2).

4.5. Media

The media is the main source of information about climate change for most Norwegians, particularly from television, newspapers (in print and on-line) and social media (Fløttum et al., 2016; Ryghaug et al., 2011), with the average Norwegian spending 29 min/day reading newspapers in 2006 (Vaage, 2009). And climate themes are becoming more visible, with for example one small newspaper in Fana (Bergen) recently committing to a climate-related article every day. Climate change also appears regularly in Bergens Tidene, with Meze-Hausken's (2007) review identifying 66 front-page stories referencing climate change between 1994 and 2003. She asserts that climate has become increasingly important in Bergen's newspapers because of the universities increasing work on climate, and because of climate model projections of increased rainfall in Bergen. "The possibility of being confronted with even greater amounts of precipitation captures journalists' attention. Local rainfall records or other weather extremes, not uncommon for western Norway, are then related to a first fingerprint for anthropogenic climate change" (Ibid: 13). To this we can add a third indirect reference to climate change in newspapers; the reporting on local government climate initiatives like toll roads.

Both Meze-Hausken (2007) and Ryghaug et al. (2011) show how the media uses weather extremes to explain climate change, and in turn, uses climate change to understand unusual weather; weather as a means of making sense of climate change. Meze-Hausken (2007: 29) notes of Bergen's Tidene; "Stories on anomalous climate [...] lead to engaged debates over causes, impacts, and mitigation for the future [...]. Scientific knowledge on topics like climate change [...] is aimed to place local happenings in a wider time and geographical perspective." On one hand, local weather events helped to materialize the once vague threat of global climate change, but on the other hand linking climate to weather events opens up for skepticism, where one cold winter can dispel ideas of 'global warming' and help people rationalize the risk as distant in time and space, and engage in denial (Nilsen, 1999; Norgaard, 2011; Ryghaug et al., 2011). Some interviewees also discussed how the media influenced the way they linked climate to weather:

"The first perspective on that that I was aware of was a news article about how high the water levels could get and what that meant for Bryggen for instance. [...] Some people were scared and others didn't believe in them. But I do feel that most people in this part of the country have a common awareness that storms may come more often and harder, and periods of rain and the amount of rain could be more extreme." (Int. 4).

Social media also facilitates the spread of climate change language and ideas in Bergen. Pictures of protests in historical newspaper archives show demonstrations in the city centre – against capitalism or for international women's day, for example – but all placards were typically written in Norwegian. It is interesting that many of the signs at the school strike demonstrations in 2019, were written in English, touting widely-used global slogans such as "There is no plan(et) B". The hashtag *Skolestreikforklimaet* has over 1,569 posts on Instagram and includes pictures of Bergenser teens proudly holding their signs, both in English and Norwegian. Some images include the face of Greta Thunberg. Certainly, social media has a role to play in the co-production of climate knowledge through language, imagery and action. Narratives are circulated between activist groups online and subsequently unfold within the city centre. Climate activist groups gather and organize events through Facebook, such as the *Fridays for Future* movement, or the civil disobedience group *Extinction Rebellion (XR Bergen)*. Posters for fundraisers and events are shared online before being papered around

the city. And groups compete for climate narratives online. Notable is the competition between the group “Folkeopprøret mot klimahysteriet” (The people’s rebellion against climate hysteria) founded near Bergen, and the reactionary group “Folkeopprøret mot folkeopprøret mot klimahysteriet” (The people’s rebellion against the people’s rebellion against climate hysteria).

4.6. Cultural processes and changes to cultural heritage sites

Climate concern is being created and performed by many cultural actors and institutions. Since 2008, an annual Climate Festival has been organised together with the Bergen International Film Festival (BIFF), showing films related to climate. In February 2018, for example, the Philharmonic Orchestra gave a free concert coupled with talks from local scientists about climate change. And that same month, the Bergen Literature House, which supports authors and cultural communities in Bergen, had an event titled ‘Verden i Bergen’ (The World in Bergen), which covered many topics, but included an interview with well-known American climate scientist and activist James Hansen. Bergen’s Literature House has established a collaboration with the Bjerknes Centre for a series of climate talks, and is linked to the Author’s Climate Action group, which writes politically on climate. Interviewee 3 suggested that climate anxieties are making their way into local literature; “One cannot rely on natural phenomena, [...] and this creates great uncertainty in the world [...] which sneak into literature via detours”.

Another interviewee was director of the Vestland Art Centre in Bergen, and he asserted that climate is an increasingly important topic in the artistic community working in Bergen; “I think climate is a strong theme among artists in Norway. There is quite a strong interest in both the more poetic side of it, and the environmental discussions around it. We have one exhibition coming up next spring, by Margarethe Brekke, who actively deals with environmental issues” (Int. 10).

4.7. Social mobilization and activism

Climate change is becoming central to local social movements, with new NGOs originating in Bergen with a climate focus. Looking at a sample of these groups, we see ‘Besteforeldrenes kimaaksjon’ (Grandparents for climate action) founded in 2006 near Bergen, mobilising climate activism from retirees. In 2008, we see the NGO Bærekraftige liv (Sustainable living) founded in the Bergen suburb of Landås, with the object of establishing ‘climate smart solutions in their local neighbourhood’, from community gardens to repair cafes. The group has since spread to other cities and become a major environmental NGO. In 2009, ‘Climate = Health’ was founded among medical students at Haukeland Hospital, and ‘Concerned Students’ founded in 2013 among University of Bergen students. The Norwegian Climate Foundation is a private sector initiative founded in Bergen in 2010. This foundation works with private enterprise towards climate-friendly products and practices, through an annual report where members voluntarily report on their emission profiles, for instance. These organisations invest social interaction and practices with climate concern in different social groups, and publicity for these NGOs appear in the streets and cafes of Bergen. The school strikes mentioned above are one recent, high profile example.

Hylland Eriksen (1993) argues that Norwegians self-image is firmly rooted in an awareness and moral concern for the environment, including climate change (Doran et al., 2018). Fløttum (2017: 52) describes the egalitarian hero in Norwegian public narratives, who sees “nature as fragile and paints overconsumption as the cause of climate change; the villains are corporations and governments [and oil-companies] driving consumption”. Small, in-depth studies in the early 2000s found groups of Norwegians who were aware of the environmental injustice – the oil extraction – upon which the comfort of Norwegian society depends (see e.g. Nilsen, 1999), but told themselves narratives of ‘denial’, to “protect themselves a bit”, or allay feelings of guilt and distress (Norgaard, 2006a). Indeed, this contradiction is inextricable and formalised in many Norwegian institutions and systems, with oil industry revenue used to create funds for national disaster relief fund, including climate-related adaptation (O’Brien et al., 2004).

Participatory democracy was a prominent theme in scenarios for Bergen in 2050, with groups predicting increased grass-roots democracy and hoping for more public spheres where people can discuss what climate change means for Bergen, and the kind of city people want to live in. Two groups used the ‘Local democracy’ dimension in their scenario.

5. Discussion

5.1. Changes of narrative: Re-representing Bergen’s climate

This paper aimed to: (a) *analyse* how climate change is emerging as a matter of concern in Bergen’s culturally-mediated public spheres; and (b) *interpret* how this concern is effecting Bergen’s identity, with implications for the city’s climate risk governance. To the first aim, we presented points of evidence suggesting that ideas of climate change are re-constituting how people represent Bergen in public spheres; from ‘a city of weather’ towards a city concerned with climate (see also work of Bremer, 2017; Haque et al., 2017). This analysis focused on structures (Section 3) and processes of change (Section 4).

Structurally, the narratives we studied showed that climate has long been part of the cultural frameworks shaping interaction in public spheres (evidence of climate as culture – Hulme, 2017; Krauß and Bremer, 2020). On one hand, we saw differentiation between how climate features in different spheres. For example, arenas of local government emphasise different climate-cultural practices (i.e. stormwater management) than in scientific spheres (weather measurement) or local art collectives (visual arts). Bergen’s rain is also differentially represented across spheres; while certain institutions embrace rain as identity – like the brewery or philharmonic orchestra – others diminished its importance, like the tourism board. On the other hand, we saw that some public narratives traversed public spheres, providing a common, place-based cultural context or identity within which public spheres are

nested. Though the spheres studied were manifestations of wider social institutions – government, media or environmentalism – they were all coloured by a distinctive cultural sense of place and climate, anchoring them in Bergen. One example is the theme of the resilient Bergenser, living an outdoor lifestyle in all weather. This theme emerged in local government and tourist brochures, local history books, most interviews, and was emphasised in the workshop.

Focusing on changes in public narratives, we revealed some the various *processes* co-producing climate concern in Bergen public spheres; indeed, the narratives constitute these processes. While we focused on a hermeneutic analysis of narrative meanings, a structural analysis is revealing of these changes in public narrative. A classical narrative structural analysis centers on a five-component schema – *initial situation, complication, reaction, resolution, final situation* (Adam, 2008; Fløttum and Gjerstad, 2017) – with the ‘complication’ mandatory to the plot. Given Bergen’s identity as Europe’s rainiest city, one might expect ‘rain’ to feature as the complication in Bergen narratives. However, we found that ‘rain’ is not predominantly problematic in public narratives, but something to live with; an integrated and resilient part of the culture. Indeed, Bergensers themselves emerge as the heroes in their own stories (see Jones et al., 2014), having learned to adapt to wet and stormy surroundings. However, after serious extreme weather events such as the landslide at Hatlestad Terrace in 2005, the narratives seem to have gradually changed. There is now a clear complication component – climate change – and an open question about how to react. In such narratives, the question of different roles (who are the victims and the villains, and are there any heroes?) becomes substantially more important than in the rain narratives.

But climate change ideas have not simply replaced Bergen’s weather culture; rather we saw a creative interplay between the two that is co-producing surprising new representations of climate change highly specific to Bergen. While ideas of global climate transform local understandings of weather, local weather-worlds simultaneously transform ideas of climate change, domesticating them to Bergen’s context. For example, Bergen’s newspapers use weather events to explain climate change; locally meaningful links are made between plastic-filled whales and climate; global slogans are juxtaposed with Norwegian folk songs at the school strike, or Bergensers extend their self-perceived weather-resilience to long-term climate change, stating: “it’s nothing we can’t handle” (Int. 7). These examples demonstrate how scientific matters of climate fact are transformed into local matters of climate concern; concerns which transcend scientific facts and address the general crisis in human – environment relationships, when linking climate change and dead whales. This creative interplay also reflects the power of climate change narratives relative to extant cultural framings in different spheres. Sometimes, climate change ideas proved themselves powerful enough to transform public spheres, re-framing Bergen from a weather to a climate city in the municipalities ‘Water and the life of the city’ policy for example. Other times, established local narratives persisted, such as the theme of Bergensers built-in climate resilience, used to diminish the gravity of local climatic change.

Owing to the power of different narratives, the social construction of a climate city is not straightforward. For Bergen, as well as for other cities and regions in Norway, the narrative of the oil producing country does contribute to block both discourse and action on climate change. Especially so through the positive oil nation narrative, pointing at the petroleum industry as one that has brought wealth and the best welfare system in the world to Norway. This is supported by the industry itself, also explaining their oil production as being much “cleaner” than in other oil producing countries. Interestingly, these oil narratives were conspicuously absent from our interviews and workshop responses, reinforcing other studies showing how Norwegian society keeps discussions of the climate ‘problem’ separate from discussions about the oil industry. Bergen city is investing itself heavily in reducing emissions, without considering the global emissions of burning the oil that its thriving oil sector extracts.

It is important to recognize these local concerns as legitimate ways of sense-making steering adaptation, no matter how ‘unscientific’ they may appear, or how much we may disagree with them. De la Bellacasa (2011) argues, “we must take care of [matters of concern] in order to remain responsible for their becomings”. In the same vein, we argue that we must take care of the local representations of climate change emerging in the places we live. This also includes recognizing how our own research on narratives – our positionality – is both shaped by and influencing of these local representations. In the face of climate change as a physical phenomenon and a shared experience, we should conduct research with care.

5.2. Implications for Bergen’s climate risk governance

To the second aim of this paper, how is climate concern effecting Bergen’s identity, with implications for the city’s climate risk governance? Bergen’s unique representations of climate change determine its risk governance response, including the time-frame within which we act. Arguably, climate change discourses intertwine geological and historical timescales (Chakrabarty, 2009), linking our present condition to Earth’s warming and cooling, and historical effects of CO₂ emissions. Indeed, these timescales are evoked in Bergen’s public sphere, in conflicting discussions over Norway’s oil sector, and the cities mitigation aspirations (see section 4.3–4.5; 4.7). But, there are other temporalities at work. In Bergen, the main temporal concern relates to a *changing weather-world*, with implications for the rhythms and organization of everyday life. Changes in seasons have quite obvious implications for farming and horticulture rhythms in and around Bergen (Sections 3.4 and 4.1), but also for social life. Activities like skiing, biking or “utepils” – having a drink on a terrace – are all seasonally defined, and also have a spatial aspect; seasons thus facilitate different uses of public space and ways to move around at different times. Furthermore, seasonal rhythms are built into society’s institutions, structuring the rhythm of school and working life for instance, and risk governance. Bergensers face seasons that do not conform to their expectations and what they plan for, with the potential to amplify risks (consider storms that come ‘out of season’), and demanding reflection on long-held ideas of seasons.

The school strikes evoke a different time scale, a notion of generational time where time is measured in succeeding generations rather than countable years. The students act as symbolic time-travelers from the future, telling the contemporary adult generation

about their concerns. In Bergen, this generational time-structure was underscored by the fact that the NGO ‘Grandparents for climate action’ participated; performed their symbolic role as grandparents, by stepping into a role as guards marked by yellow vests. The figuration of generational time works as a vehicle for downscaling climate change, in both temporal and spatial senses, to a here-and-now concern – in Bergen (Kverndokk, forthcoming).

Reframing Bergen as a climate city implies an orientation towards the future, from the fear among young demonstrators, to the trust in a technological transmission to low-carbon society expressed as a vision of the Climate Plan for Vestland. Bergen’s local government climate policy is adopting a distinctly future-oriented perspective that breaks starkly from its weather culture that emphasizes past accomplishments like the water management system, and the inherited resilience to wild weather. For instance, the increased risk of flooding in Bryggen, puts emphasis on future risk in heritage management.

5.3. Bergen in the global context

We started this article asserting the emergence of ‘climate cities’, using the example of Bergen, and we finish by arguing that these city-based processes also have significance and can have an impact on global climate risk governance. While climate science, policy and activism are shaping our cities, the particular cultures and institutions in our cities are influencing how we think about and respond to climate change, including at global scales.

Our findings stress diverse observations in the wider literature on rapid and accumulative processes of co-producing risk governance. For example, shock events are observed as potential windows for rapid policy change (e.g. Burningham et al., 2008; Bradford et al., 2012; Runhaar et al., 2012; Marschütz et al., 2020), and this was the case in Bergen where the 2005 landslide functioned as a shock, and potentially other events like the dead whale for example. Accumulatively, well-functioning science-policy interfaces appear active in changing climate risk governance, through facilitating diversification, connectivity, decentralization, and inter-country learning (Hegger et al., 2020). The presence of a tightly-knit science-policy(-society) interface in Bergen has arguably contributed to the change in public narratives. Related, the co-production literature highlights the social learning that emerges from tensions in the public sphere, identifying discrepancies as well as shared understandings of climate change (Hegger et al., 2012; Bremer and Meisch, 2017). This also relates to overlaps or discrepancies between old and new narratives of risk. In a parallel study in the Dutch city of Dordrecht, climate change fitted well with the local ‘island identity’ and historical and recent experiences of flooding (Marschütz, 2018; Marschütz et al., 2020). Both Dordrecht and Bergen underline how local identity and historic experience with hazards can enhance climate resilience (Brown, 2016; Wardekker, 2018). On the other hand, in both cities, the danger is that climate change risks become ‘domesticated’ to local experience – assuming ‘more of the same’ – without accounting for new emerging risks (Marschütz et al., 2020). Such domestication can resist change to existing governance and lead to purely shock-based adaptation (cf. weather) versus novel, gradual, and longer term challenges (cf. climate). Bergen seems to have overcome this hurdle and shifted perspective, and other cities could learn from this.

Cities worldwide are certainly attempting to learn from each other. There are active networks of climate cities, through which city organisations share information and ideas, expertise and experiences (Ilgen et al., 2019; Keiner and Kim, 2007; Seymoar et al., 2009), such asICLEI Local Governments for Sustainability for example, of which Bergen is a member. Member cities promote themselves as ‘climate leaders’ (Brown, 2016). Similarly, cities are involved in global science networks, with Bergen part of many European research project consortia, from MARE to BINGO, or the CoCliServ project presented here. Cities in such networks do highlight their own unique (locally co-produced) identities, histories, cultures, and climate risk governance. However, as seen in Dordrecht above, there are often similarities as well, and cities can learn from each other. Meaningful city-to-city learning then often depends on a plastic interplay between crafting narratives that are at once unique and global; the extract about the school strike at the beginning of this paper shows this dynamic in action. This interplay between old narratives and the need to, at least partially, revise them or shift to new ones may be a common challenge for many cities worldwide. Bergen’s experiences could be helpful in this process, underlining the importance of studying climate cities cultural representations of climate, for climate risk governance scholarship and practice.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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