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Facing climate injustices: Community trust-building for climate services through arts and sciences narrative co-production

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\textbf{ABSTRACT}

The goal of this paper is to analyze how and with what results place-based climate service co-production may be enacted within a community for whom climate change is not a locally salient concern. Aiming to initiate a climate-centered dialogue, a hybrid team of scientists and artists collected local narratives within the Kerourien neighbourhood, in the city of Brest in Brittany, France. Kerourien is a place known for its stigmatizing crime, poverty, marginalization and state of disrepair. Social work is higher on the agenda than climate action. The team thus acknowledged that local narratives might not make much mention of climate change, and recognized part of the work might be to shift awareness to the actual or potential, current or future, connections between everyday non-climate concerns and climate issues. Such a shift called for a practical intervention, centered on local culture.

The narrative collection process was dovetailed with preparing the neighbourhood’s 50th anniversary celebration and establishing a series of art performances to celebrate the neighbourhood and its residents. Non-climate and quasi-climate stories were collected, documented, and turned into art forms. The elements of climate service co-production in this process are twofold. First, they point to the ways in which non-climate change related local concerns may be mapped out in relation to climate change adaptation, showing how non-climate change concerns call for climate information. Secondly, they show how the co-production of climate services may go beyond the provision of climate information by generating procedural benefits such as local empowerment – thus generating capacities that may be mobilized to face climate change. We conclude by stressing that “place-based climate service co-production for action” may require questioning the nature of the “services” rendered, questioning the nature of “place,” and questioning what “action” entails. We offer leads for addressing these questions in ways that help realise empowerment and greater social justice.

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1 Introduction

Box 1

On the irony of writing about priorities and interconnectedness during COVID-19 lockdown.

Today, there is some irony for us to work on a paper tackling issues of priorities, justice, and the interconnectedness of climate issues with most issues of social justice. As we are writing these words, we are locked-down, contributing, through isolation, to a fight against a very disruptive world scale pandemic. We have somehow imperfectly shifted our priorities. Many of us observe that COVID-19 has shifted all sorts of priorities. Some of us long for a world a world where priorities will be, at long last, straightened-out – thanks to the lockdown and the realization that some things can grind to a halt if really needed (Latour, 2020). Some see current events not so much as a crisis, but as a necessary, and painful, wake-up call leading to an evolution in our ways of inhabiting the world. If there is lesson to be learned from COVID-19, it is that priorities are contextual and short-term crises, mutations, may blind us from more pressing challenges (the intertwining of climate change and pandemics takes many twists and turns, see for instance Ord, 2020). We have known for a long time that pandemics and climate change may be connected, and climate justice may very well be one of these connections.

This paper contributes to the growing body of the literature on climate service co-production; co-production understood here as a normative practice that consists in “the deliberate collaboration of different people to achieve a common goal” (Bremer and Meisch, 2017, pg. 2). We chose to analyze a climate service co-production situation where potential climate information users were not necessarily aware of the importance of climate change in their daily lives. We developed an intervention allowing for the analysis of how and with what results place-based climate service co-production may be enacted within a community whose locally salient concerns do not include climate change.

While envisioning local climate change adaptation action, one may have to face the fact that for some communities climate change might not be high on the local agenda. The issue is not necessarily that such communities negate the salience of climate change and its impacts. Some communities may have other challenges that are more pressing and not obviously climate related: marginalization, poverty, resource depletion, crime, sense of powerlessness, health, housing, education, cultural erosion. Some communities are facing short-term challenges for which all their energy is mustered – other stressors do matter (e.g., Ahmed et al., 2016, McCubbin et al., 2015). Yet these communities are and will be facing climate change and its impacts. It is quite likely they are already in a position where climate change adaptation may be necessary. They may thus need climate science attuned to their specific challenges, however they are not yet part of the visible “demand side” for climate services such as climate information.

Climate science will have to deploy itself in accordance with their priorities, which are not climate-centered. These situations raise questions about the legitimacy of climate action in the face of social and economic hardship not directly connected to climate challenges. Who has a say in priority setting? Can an issue seen as salient from outside a community be somehow made salient for those within the community? By whom, and under what conditions, is exogenous priority-setting acceptable?

Concern about exogenous priority setting and its associated marginalization led our team of scientists and artists to engage in fieldwork in the Kerourien neighborhood, the results of which we present in this paper. We share a story of seemingly competing priorities, external and internal. Through climate service co-production, which we see as an avatar of transdisciplinary research, we conducted a real-life experiment where scientists and artists focused on developing approaches for place-based climate service co-production by reaching out to a community that has other, more pressing concerns than climate change. The Kerourien neighborhood, in the city of Brest located on the coast of the Brittany region of France, is better known for its stigmas (e.g., high unemployment rate, state of disrepair, drug-related violence) than for its awareness of climate issues. Yet climate change is the symptom of broader issues, and is intimately connected to social issues (see Krauss, 2020) and it seemed to the research team that Kerourien’s challenges deserved to be explored through the lens of climate change.

We first present a summary of the literature we drew from to design our on-site intervention, including: climate change adaptation and local contexts, art and science approaches to climate intervention, and climate service co-production as an empowering trans-disciplinary practice. We then describe the CoCliServ project and the Kerourien community. The results section focuses on the process in which we participated, its outputs in terms of approach, procedural and substantive benefits, and entry point for place-based climate information design. We focus on locating climate change within apparently non-climate related narratives and on the ubiquity, yet invisibility, of climate change within Kerourien. We further discuss the procedural and substantive benefits of the work conducted.

2 Local context, climate services, and art and science co-production

“Climate science usability is a function both of the context of potential use and of the process of scientific knowledge production itself” (Dilling and Lemos, 2011).

It is now widely documented that climate change adaptation is dependent upon local contexts and there are no one-size-fits-all solutions (IPCC, 2014). Culture (Adger et al., 2013), local knowledge (Naess, 2013), local institutions (Berman et al., 2019), the intertwining of local and global political forces and history (Kennedy et al., 2018), are examples of dimensions that define the ability of a community to face climate change. The provision of meaningful and usable climate information at the local level, therefore, entails some sort of tailoring. There are now case studies illustrating the mismatch between climate science and local interests (e.g., Baztan et al., 2017).

Providing information does not necessarily mean local users will be able to make use of it. Climate science may need to be linked
more directly to local communities, to their particular capacities and contexts of vulnerability (IPCC, 2014, Vaughan et al., 2016). As Bremer et al. (2019) put it, “scholars and practitioners have been ill-equipped to describe the contexts where climate services are introduced, or interpret how context can shape the way they develop” (pg. 47).

Co-production has been proposed as one approach for addressing the challenge of turning climate science into a usable climate service. Not only does knowledge co-production allow for better usability and implementation, it has many increasingly documented benefits such as social learning, empowerment, and inter- and intra-community trust building.

2.1 Climate service co-production

For the purpose of this research we used, as starting point, Vaughan and Dessai’s (2014) definition of climate services: “The aim of climate services is to provide people and organizations with timely, tailored climate-related knowledge and information that they can use to reduce climate-related losses and enhance benefits, including the protection of lives, livelihoods, and property” (pg. 588). When considering this definition, we focused on providing people with climate tailored knowledge, “people” understood as members of local communities. The central challenge we wished to address was that of “tailoring” climate knowledge and information for communities at the margins, who might not be very aware of climate issues.

Such tailoring of climate knowledge is closely associated with the ability to establish iteration (Dilling and Lemos, 2011) and dialogue (Vaughan and Dessai, 2014) between scientists and non-scientists in the course of knowledge production and use. Climate knowledge co-production, the “deliberate collaboration of different people to achieve a common goal” (Bremer and Meisch, 2017, pg. 2) has been proposed for quite some time (e.g., Lemos and Morehouse, 2005) to address challenges of initiating and maintaining such reiterations and dialogues. But what if this dialogue needs to be established on grounds other than those of climate change?

Bremer and Meisch (2017) conducted an extensive mapping of the literature on climate change research co-production. They identify a series of eight “conceptual lenses” and call for a “self-reflexive transparency when using co-production concepts” (pg. 1) to address the concepts’ polysemy. Within their framework, the work we conducted lies at the juncture of several objectives associated with these lenses: we want to integrate non-scientists as co-investigators (extended lens); we wish to sustain interactions between climate science providers and users (iterative interaction lens); we pursue a goal of empowering local experience, and thus of local knowledge (empowerment lens); we recognize the need to facilitate social learning about climate issues (social learning lens); and we are embedded in a culturally-rooted goal to improve public service through the joint engagement of government agencies and citizens in the production of new knowledge (public services lens).

All these objectives are associated with acknowledging the current uneven distribution of access to, and benefits from, climate services development (Vaughan and Dessai, 2014). For instance, Harjanne (2017) surveyed institutions related to climate services to identify how they justify the need for climate services (as a departure from climate science), and identified the following rationales: the global and widespread nature of the climate challenge; specific industry needs; socio-economic value; technological potential; and deficient supply and demand. There seems to be very little room left for marginalized communities. In the work presented here, we envision the co-production of climate services, not because we perceive co-production as a “value in itself” (Voorberg et al., 2015), but because we see co-production as a means to create and nurture sustained interaction with marginalized communities while contributing to their empowerment. We wish to explore means for correcting the inequitable distribution of climate change knowledge for action.

This uneven distribution in part reflects the fact that not all communities are equal and some are facing such immediate challenges that climate change may be invisible to them. Over the course of the research presented here, this called for working to shift awareness to the actual or potential, current or future, connections between everyday non-climate concerns and climate issues. Such a shift required a practical intervention centered on local culture. We chose to work hand-in-hand with artists to conduct such an intervention, as art is well-identified as an approach to make visible the “invisible or almost-visible” phenomenon of climate change (Knebusch, 2008). Art is also identified as facilitating access to narratives in general, and climate narratives in particular (Roosen et al., 2018).

2.2 Art and science integration for climate intervention

Art-based intervention has been proposed in the context of climate change for quite some time (Lippard, 2007, Volpe, 2018). This is not without pitfalls such as instrumentalising art, and reproducing dominant categories and codes through art (Miles, 2010). Experiments have shown that through public participation and activism, art may be empowering, and may shift attention to issues that question dominant paradigms (Sommer and Klockner, 2019).

Several dimensions have been identified for collaborations between art and science: new understandings and capacities within and across the arts and sciences involved (Gabrys and Yusoff, 2012); catalysing explorations of the scientific context and critical re-imaginings of research practices (Rödder, 2017); helping to engage multiple senses and emphasizing social interaction within research practices; aiding participating researchers in thinking creatively (Jacobson et al., 2016); redesigning social relations to natural systems (Armstrong and Leimbach, 2019); rearticulating politics and knowledge (Latour, 2011); offering more effective approaches to engaging multiple publics in climate-compatible behaviour change; and engaging explicitly with the under-researched issue of the role of place attachment and local, situated knowledge in mediating the influence of climate change communication (Burke et al., 2018).

Capitalizing on these observations, we developed the working hypothesis that iterative art and science approaches have the potential for instigating and sustaining community dialogue through efforts to co-produce climate services. We saw art as essential for
making the concept of climate services more meaningful in a specific place, and focused on narratives as an entry point for co-construction. Artists are ideally placed to challenge existing narratives and to provoke the exploration of new narratives. The intermeshing of nature, culture, emotions and reason around weatherscapes implies that approaching local climate through science could be put into perspective by a more intuitive approach seeking to represent the world as perceived by the senses. Such an approach has been achieved by including the arts in social dynamics together with scientific research and innovation (Bilodeau, 2013). We envision the integration of art and science not in terms of using the arts to communicate scientific findings, but rather in terms of gaining access to elements that are generally excluded from scientific inquiry to convey a more complete picture of the challenges at hand. Developing a strong connection between art and science enables the re-articulation of the scientific description of the world (Latour, 2011).

We proposed to test if an art and science based ‘recomposing’ of the world (Latour, 2010) allows for locally clarifying ambiguous concepts such as climate change and associated “services”. Our investigation entailed examining the potential of art ‘gestures’ (Citton, 2012) and the ‘practices of everyday life’ (de Certeau, 1990) to facilitate cultural translation between different fields of knowledge and the associated diversity of priorities.

3 Setting of the transdisciplinary work
3.1 Narrative-based inquiry within the CoCliServ project

The results presented here are from a broader project entitled “Co-development of place-based climate services for action” (CoCliServ, http://cocliserv.cearc.fr), implemented in parallel at five sites: Jade Bay in Germany (Krauss, 2020), Bergen in Norway (Bremer et al., 2020), Dordrecht in the Netherlands (Marschütz et al., 2020), the gulf of Morbihan (da Cunha et al., 2020), and the Kerourien neighborhood in Brest, France. These sites follow a shared methodological design starting with narratives as an entry point (Krauss, 2020) and extending to incremental normative scenario design (Vanderlinden, 2015). These steps are transversely associated with: (a) identifying available climate information and potential gaps to be addressed now or in the future, (b) developing a suite of representational tools and participatory approaches (e.g., outreach material, art and science procedures, participatory metadata scheme developments and mapping, citizen science), and (c) creating a knowledge quality assessment protocol tailored to the needs of the project.

The narrative dimension of the project is seen simultaneously as a “first step” and a step that yields results in and of itself. More details on the CoCliServ narratives can be found in the “narratives of change” work, led by Werner Krauss (Krauss, 2020, Krauss and Bremer, 2020).

One of the central challenges in designing the CoCliServ project related to generating a sufficiently broad and diverse set of ground-truthing sites to assess how the approach would fare in different settings as it was being developed and tested. Within the participating communities, the Kerourien site -the focus of the experiment we present here- was unique. In Kerourien, climate change is not a visible concern; residents of Kerourien face other daily struggles that take priority and the research team had to adapt to their situation.

3.2 Kerourien

The peri-urban neighborhood of Kerourien is in the port city of Brest (Brittany, France). It is located in a coastal area with low population density on the western edge of France. Kerourien is a 30-minute walk from where the Bay of Brest connects to the Mer d'Iroise, part of the Atlantic ocean system. It is technically coastal, however its residents are not seafarers or fishers, they live in a suburban housing development similar to many found throughout France.

3.2.1 Climate change in a quasi coastal context

Climate change and its effects have been studied in the Brest area for decades. We know today, as shown for example in L’Hévéder et al. (2017), that temperature plays a fundamental role in ocean circulation; stratification; chemical and biogeochemical processes such as degradation, dissolution, precipitation; and in controlling the spatial distribution, metabolic rates and life cycles of marine flora and fauna (e.g., Bissinger et al., 2008, Chen, 2015, Helmuth et al., 2006, Philippart et al., 2011, Thomas et al., 2016 in L’Hévéder et al., 2017). Kerourien’s context is that of an oceanic region with sea temperature sensitive to global change, this area is a biogeographic boundary zone and in recent years warm water species have become much more common (Southward et al., 1995). Ecological problems related to sea surface temperature change also include alterations in nutrient delivery from land to sea; arrival of invasive species and changes in host–pathogen relationships and biological interactions (Poloczanska et al., 2008). These observations are combined with coastal erosion and extreme weather events such as droughts, exceptional storms, and heat waves, as experienced in 2003.

3.2.2 Climate change adaptation within a larger urban planning context

The 2019–2025 city climate plan for Brest pays particularly close attention to mitigation, and thus to energy production and consumption, concluding that: (i) housing (heating, hot water, and all uses of electricity) is responsible for 36% of energy consumption in the Brest metropolitan area and 28% of greenhouse gas emissions. The energy used in the Brest metropolitan area is mainly of fossil origin (gas: 37% and oil: 35%), the net quantity stored annually in the Brest metropolitan area is estimated to be 8633 tonnes of CO2, i.e., around 1% of its annual emissions. While adaptation planning is a legal requirement, mitigation seems to remain higher on the city’s list of priorities.
3.2.3 Some of Kerourien’s key characteristics

Kerourien has 1200 residents (2013 census), and the neighbourhood is mostly organized around post-war housing projects. It is a priority area for the city, which implies a well-identified social vulnerability including demographics such as: 24.4% single-parent families, with 40% of its residents under the age of 25, and more than 20 nationalities represented. Kerourien is one of the most diverse areas in the city and faces the most challenges in terms of urbanization, migration, and disempowerment (Fig. 1). Thirty-two percent of its inhabitants are unemployed versus 12% in the rest of the city, with an apex of 46% for youth between the ages of 15–24 versus 21% for the rest of the city. The schooling rate for youth ages 18–24 is 35% versus 65% for the rest of the city. This is Kerourien’s current context. From the neighbourhood’s beginning there have been efforts for improvement conditioned by its unbalanced social structure. Currently five formal social work organizations conduct on-going efforts here, but with high unemployment and growing imbalances, the question often arises: “who helps whom?”

4 Key observations

4.1 On the process of linking a local event and our climate services centered inquiry

The initial step of our co-production work focused on collecting narratives. This was an ad hoc process, which evolved along the way. We present our approach and associated observations as the first part of our results, describing the organisational stages and observations of procedures and materials (Table 3).

As a starting point, we formed a working group with four partners who had participated in preparing the project, including: The Maquis, the Centre social Couleurs quartier, the Theatre du Grain, and the CEARC research center.

The five initial meetings focused on identifying the means to simultaneously mobilize the neighbourhood around locally salient issues while giving access to potential conversations about climate-related concerns. The upcoming 50th anniversary of the neighbourhood was chosen as an opportunity to achieve this goal.

A list of stakeholders was established by the four core partners with the provision that snowballing was possible if a category had been overlooked. Accordingly, over the course of events we incorporated additional partners, but to a limited extent and very progressively. The initial stakeholder list comprised eight groups and institutions. After limited snowballing, it expanded to 14 members (Table 1).

These stakeholders were invited to a foundational meeting to identify shared objectives within the context of organizing Kerourien’s 50th anniversary celebration. The goal that generated the most widespread support was to dispel the myth that “in Kerouien only bad things happen”. The anniversary celebration was thus named les Belles histoires de Kerourien (Kerourien’s beautiful stories). The group of 14 stakeholders formally became the local coordination committee for the 50th anniversary.

At that point, the aim of climate service co-production seemed remote. However the intention, climate-services wise, was to gather narratives in order to explore the linkages between explicit concerns and climate issues, which seemed mostly invisible in Kerourien. Working on les Belles histoires with and for Kerourien residents seemed to be a challenging and promising opportunity.

We held monthly meetings of the 14-member local coordinating committee. These occurred under the leadership of its rapidly established executive board, composed of four members of the initial core working group. In the course of these meetings, stories were progressively identified. Four important developments were observed:

1. Members of the group acknowledged the need to increase the involvement of community members;
2. Systematic archive research became necessary because, according to those around the table, the stories being told needed anchoring in dated, identifiable events that those present had not necessarily witnessed but that were still part of the memories of the neighbourhood;
3. An interview protocol was devised to simultaneously involve more members of the local community and gather stories in the words of those most affected;
4. Practical matters were delegated to implementation committees tasked with managing specific practical concerns for the 50th anniversary celebration, such as: welcoming/ticketing; hiking, cycling, scooters; canteen/kitchen organizing; reports, video editing, projections (17 in total). These were powerful recruitment tools, and many community members participated.

These developments were important on two levels. First, the local coordinating committee turned to the a priori climate-centred transdisciplinary team to mobilise their expertise in terms of public participation and research. Second, it allowed for a more systemised approach to recruitment and collecting local and non-local narratives.

A transdisciplinary research design was then adopted to prepare the 50th anniversary celebration and its associated art form. This included systematising the identification of archive materials, their sorting, key-wording, storage, and subsequent use. These archives contained materials such as: personal photographs, drawings, memorabilia, media excerpts, and recorded songs collected through on-site participant observation. Gathering the archive had two effects. First, it allowed us to put Kerourien’s stigma in perspective both as the product of historical and political processes, and as the product of the amplification of anecdotal events. Second, compiling the archive also lent a sense of materiality to the process.
A semi-structured interview protocol was designed and the associated interview framework was developed. Both were developed with input from the local coordination committee and members of the local community. The interview protocol contained the following questions:

- Where were you born?
- What was the path you took that brought you to Kerourien?
- Can you tell us about the first time you came to Kerourien? How did you feel?
- Tell us about three events in Kerourien that have been important to you (personally).
- How do you feel when you look at Kerourien today?
- Can you describe three dreams you have for Kerourien in 2050 (in 30 years)?
- What would it take to make them come true?
- Do you have anything you would like to add?

The interview process led to the collection of narratives that stressed the need for *les Belles histoires*. Interviewees were proud to be part of the neighbourhood and expressed a deep wish to shift the stigma and be seen by the city as the decent people they recognise themselves to be:

“What I like is the moments when you help people and they thank you. Help with a stroller, or the shopping bags of an elderly lady, hold a door. Small moments like that and people thank you. A thank you. Not much, but attention, a gesture, a coffee, a smile.”

“We have lots of things to do. And in Kerourien we think, we act, we do a lot of things for people to gather. Faced with the disorder of the world, here Kerourien is bubbling with ideas. How, in the face of global reality, we invent something here to rebuild, to find meaning, with the people of the neighbourhood. Many people do not give up. Continue tirelessly to fight, to resist. Day by day. Right here. Now.”

At that point, our experiment in climate service co-production had taken quite a turn. First, narratives were being collected with a level of robustness that would make them usable in a science-centred process. Second, the team of climate social-scientists and artists were putting their skills to work to serve the local community in realms that may seem far removed from climate issues, but that allowed for a fascinating exercise in trust building and, as a result, quite extensive data collection.

Papers, objects, newspaper clippings, bits and pieces of local narratives, were made physically available. This led to another important development: obtaining two rooms and bathrooms fully dedicated to those preparing the 50th anniversary celebration. This locally anchored what had otherwise been a “placeless” exercise. Stories, archives, drawings, timelines all could be pinned on the walls. Interviews were conducted in the *les Belles histoires* room. Involvement continued growing, with community members “just passing through” to “take a look,” and thereafter staying around, becoming contributors to the anniversary celebration preparations and the archive and narratives corpus we were compiling (Table 2).

For the climate service co-production work, it meant a wealth of stories were made available. Ongoing dialogue with and participation from the artists meant that a central art form was taking shape. This acted as a filter, prioritizing local issues as they appeared in the stories being told. A script and a scenography emerged, encapsulating the stories being told in Kerourien.

This process (Table 3) led to material and procedural benefits. On the material front, robust data were collected. These were used for creating an art form and for laying the foundations for the climate service co-production process. On the procedural front, the neighbourhood was highly involved and, more importantly, trust had been built and mobilised for collective action.

What did the climate service co-production component of the process learn from the exercise up to now? First, we witnessed progressive involvement from community members. By embedding ourselves in a process focused on highly salient non-climate related issues we gained access to community members and to issues that would not have been accessible otherwise, including a diversity of narratives.

| Name                                      | Structure                      | Role                     |
|-------------------------------------------|--------------------------------|--------------------------|
| Le théâtre du Grain                       | Theater company                | Project partner          |
| Le Maquis                                 | Policy “factory” NGO           | Project partner          |
| Centre Social Couleur Quartier           | Social center                  | Project partner          |
| Mairie de Quartier de Saint-Pierre        | City service                   | Local stakeholder        |
| Association Don Bosco                    | Social inclusion NGO           | Local stakeholder        |
| Brest Métropole Habitat                  | City services                  | Local stakeholder        |
| Confédération syndicale des familles (CSF)| Consumers NGO                 | Local stakeholder        |
| Jardins partagés de la Fontaine Margot   | Shared garden NGO              | Local stakeholder        |
| Les Lapinoux                             | Nursery assistants NGO         | Local stakeholder        |
| Groupe scolaire Jean de La Fontaine      | School                         | Local stakeholder        |
| Cinémathèque de Bretagne                 | Audio-visual NGO               | Local stakeholder        |
| Canal TiZef                               | Audio-visual NGO               | Local stakeholder        |
| City Hall                                 | City service                   | Local stakeholder        |
| Residents                                 | Non-associated Residents       | Local stakeholder        |
Table 2
Summary description of the data collected through the joint process of preparing Kerourien’s 50th anniversary and collecting narratives as part of the climate service co-production process.

| Primary or Secondary Source | Type                                      | Number of items | Reference Code |
|-----------------------------|-------------------------------------------|-----------------|----------------|
| Primary                     | Audio interview                           | 15              | AI             |
| Primary                     | Video interview                           | 7               | VI             |
| Primary                     | Workshop                                  | 1               | W              |
| Primary                     | Art Form                                  | 3               | AF             |
| Primary                     | Meeting minutes                           | 10              | MN             |
| Secondary                   | Unpublished papers, not peer-reviewed     | 3               | UNPRP          |
| Secondary                   | Published papers, not peer-reviewed       | 302             | PNPRP          |
| Secondary                   | Published peer-reviewed papers            | 2               | PPRP           |
| Secondary                   | Published reports and books               | 7               | PR             |
| Secondary                   | Selected press releases                   | 25              | SPR            |
| Secondary                   | Films                                     | 2               | F              |
| Secondary                   | Songs                                     | 16              | S              |
| Secondary                   | Official photographs                      | 5               | OP             |
| Secondary                   | Residents’ selected photographs           | 25              | ISP            |
| Primary                     | Project selected photographs              | 25              | PSP            |

Table 3
Chronological summary of the process of jointly organizing Kerourien’s 50th anniversary and collecting local narratives.

| Event/Activity                                                                 | Date             | Key observation                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start of the project’s implementation in Kerourien / Setting up the working group | 09/17            | These four partners have a well-established working relationship: trust between them is well established. Issues of symbolic hierarchies, associated with status (artists are not as regularly employed as social workers or scientists) |
| Initial meetings and identification of a modus operandi / Decision taken to contribute proactively the neighbourhood’s 50th anniversary celebration. | 6/10/17          | The anniversary was to take place in June 2018, then delayed to October 2018. Content and program are still a total blank slate.                                                                                       |
| Identification and invitation of all potential stakeholders / Foundational meeting of the local coordination group. The initial working group is turned into the local coordination group executive board / Proactively implementing the local coordination groups’ decisions. | 26/10/17         | Meeting facilitation was organized around the following aim: identifying a common goal for all present, around which everyone could be mobilized. Of the 14 members, 10 are residents of the neighbourhood and act as initial proxies for the resident population. |
| Monthly meetings of the local coordination group / Discussing the planning and programming of the 50th anniversary. Leaflet for volunteers. | From 11/17 to 11/18 | All decisions taken collectively. When the group deemed it necessary, votes were organized. This was the first step to spread the word and be publicly explicit with the intentions and partnerships. |
| Tasking a specific group with conducting interviews. Obtaining fully dedicated facilities (2 rooms and bathrooms). Moving the date of the anniversary from June to October. Establishing thematic working groups / 17 specialized working groups are created. | 10/2017-06/18    | Agreement with the City as landlord. The decision was taken to document the process more systematically. These working groups are open to anyone willing to contribute to organizing the 50th anniversary. |
| The public presentation of the “beautiful stories” process. | 01/18            | At 10 h, 15 h and 20 h to be sure all residents have the chance to come if they wish.                                                                                                                                |
| Formal closure of the social centre after arson. | 15/01/18         | The perpetrators are identified but the ongoing efforts of trust-building are damaged as well as the front door of the social centre itself.                                                                            |
| Weekly meetings / Discussing the process and detailed programming of the 50th anniversary. Poster proposed by the graphic artist, discussed at the coordination level and the final version made available to spread the word. | From 03/18 for some of the working groups. 06/18 | Some meetings are working-group focused, some are plenary with all partners. A new iconic image for the neighbourhood.                                                                                               |
| Final programme available. Efforts increase progressively going from weekly to daily. Kerourien’s beautiful stories. “Beautiful stories” review meeting. | 07/18            | The number of people engaged grows day by day, the thematic working groups structure is key. A popular success with a strong public and mass media impact. People express that Kerourien is whole again, community members have a renewed sense of sharing common narratives. |
|                                                                              | 09-10/18         |                                                                                                                                                    |
|                                                                              | 17-21/10/18      |                                                                                                                                                    |
|                                                                              | 11/18            |                                                                                                                                                    |
More importantly, and this came a bit as a surprise, the transdisciplinary abilities of the research team were called upon to help achieve non-science centered goals. An initially asymmetrical situation became a situation of more balanced cross-fertilization. Somehow our respective specialized lines of action became blurred and from this trust and capacity for action grew.

This situation created a central question: how do we manage the different natures of the various processes at hand – celebrating Kerourien, preparing an art form, and identifying how local issues relate to climate issues within the context of climate service co-production?

As stated above in section 2.2, our working hypothesis was that all issues are connected with climate issues, and these connections deserve to be made explicit. This hypothesis led us to commit to maintaining the blurring of the lines as artists working with and for social scientists when it came to the climate dimension; and social scientists working with and for artists when it came to preparing the art form, rooting it in local issues and giving the identified and collected stories back to the community.

4.2 Central narratives identified and used for the art form and the climate-centered analysis

The process described here between artists, social scientists, and community members led to the joint identification of a series of three narratives seen as fundamental for the local community. These are available in detail, including interview quotes and the final script of the play, in the supplementary materials. We summarize these materials here, highlighting the most important characteristics. The narrative identification and explication process was conducted through a systematic analysis (iterative thematic analysis), conducted by the social scientists. The creative writing and scenography was conducted by the artists. These phases included on-going interaction with community members, and thus evolved under their constant scrutiny, including during the first (Fig. 2) and following days of the play.

Here we present the narratives in the order of their “discovery”.

A first narrative that stood out was that of the Kerourien neighbourhood, its origin, and the trajectory of its first residents. Schematically this narrative reads like this:

**Box 2**
“Girls don’t dance with us when they know we’re from [...]” – Kerourien’s history in a nutshell.

1. In 1944, the fight for the liberation of France led to the widespread destruction of Brest (many families lost their houses and could not afford to find new ones – how to relocate them became an urgent issue).
2. Barracks were built as emergency housing for those affected (twist: a new community emerged, that of “those from the barracks”).
3. Living in the barracks was associated with the stigmas of poverty (and led to the emergence of a sense of “us and them”).
4. In 1966 a subsidized housing development was constructed (and living conditions in the barracks degraded due to the clear malfeasance of authorities – yet solidarity was maintained within the barracks).
5. The construction work went fast, entailed huge effort from construction workers (the sacrifices of many, coming from many countries made the Kerourien neighborhood possible – solidarity is all over the place).
6. People moved in and an official inauguration ceremony was held 1972 (and yes the barracks were destroyed; those “from the barracks” became “those from Kerourien”).
7. Thing went downhill in the mid-1980s and those who could afford it, and did not feel attached, left the neighbourhood).
8. The newly vacated apartments became housing for the “newcomers” (and the current residents represent 20 nationalities – those “from the barracks” are now a minority group in Kerourien).

When this narrative was identified, the experiment in climate service co-production could have taken a wrong turn. We could have had the illusion that access to the “place” had been gained. However the place, as a stabilized geographical and administrative space, located in Brest, France, turned out to be a misconception. Kerourien is made of many places, associated with the diversity of its inhabitants. Does that mean this story should have been dispelled as useless? Certainly not, it gives a wealth of information. For example, there once was agriculture, and the weather matters when discussing construction work. Yet this is not Kerourien’s only story. Other stories matter, and we did gain access to those as well. The second important story of Kerourien reads as follows (see Supplementary materials for details and interview excerpts):

**Box 3**
“The first generation laid low. The second generation crashed. The third is restless.” – Kerourien’s recent-present narrated as a multicultural entity.

1. We, the newcomers, settled in Kerourien after leaving home (from abroad) in order to find a better life (and yes we did find it, at first).
2. Since the 1980s Kerourien’s population has been in flux (and individuals carry their sometimes heavy personal histories, and their traditions, seen as source of positive diversity).
3. Integration within a diverse mix is proactively pursued (not always easily, xenophobia exists, as well as clear challenges associated with highly intercultural settings).

4. Progressively newcomers are disappointed and often regret leaving their home country (and feel that promises that were made, mostly of vertical social mobility, are unkept).

5. There is nostalgia for elsewhere and anger toward “here.” (Kerourien encapsulates the love-hate relationship that any migrant community may have with its new country).

Once this narrative was identified and clarified, we stumbled on something fundamental in terms of climate services development. Kerourien is, for its population, just one of the places that matters. When envisioning Brest’s humid climate, it is compared with a place of birth, which is, for many, the place where they long to return upon retirement. If we are about to co-produce place-based climate services, we must prepare ourselves to expand our geographical horizons beyond Brittany.

Further conversations indicated that these narratives of Kerourien’s history and the histories of its “newcomers” were connected though other avenues beyond simply being from Kerourien. Both “newcomers” and those “from the barracks” share life trajectories of adversity, proactive fights against dominant forces, and the need to contribute to a sense of justice. These characteristics are connected to the third dominant narrative we identified.

Box 4
“I have a say” – Kerourien narrated as a place fighting for justice.

1. The harshness of the life in Brittany, the war, and post-war reconstruction, created in Brest strong unions, a strong civil society, ready to fight for its rights (even more so in low income neighbourhoods such as the barracks first, and Kerourien thereafter).

2. The fight for social justice led, in the 1960s and early-1970s, to genuine progress that reinforced Kerourien residents’ conviction in favor of social justice and the need to fight.

3. These convictions were reinforced when the Amoco Cadiz oil spill affected a summer campground where Kerourien residents went for vacation (and they fought for justice following this major environmental crime).

Fig. 2. Photos taken during the first day of the play, showing the projection on one of Kerourien’s central buildings and the two actors on the Kerourien theater set. The 58-minute video with captions is available through this link: https://www.youtube.com/watch?v=QIUBACMW7pU.
4. This commitment to social justice was confirmed, even as newcomers were the majority in the neighborhood now, during the 2002 presidential election when the far-right candidate made it to the second round (people registered en masse as voters in order to have their voices heard).

5. Today in Kerourien community members continue walking the same streets while their context becomes increasingly fragile, they still want to take charge, but feel increasingly unable to shape their world.

At this stage, the experiment in climate service co-production had access to a unique and locally validated dataset of narratives. These encapsulated local priorities, concerns, and, to a much smaller extent, their interaction with weather and climate.

4.3 Local life and climate change, connecting the dots

The narratives we collected show that Kerourien residents are, indeed, stressed by their daily economic constraints along with societal challenges related to gender, racism and well-being. They do not seem to show much interest in Kerourien’s weather and climate.

Furthermore, when envisioning a relationship to the nexus of place, weather, and climate, the narratives seem to indicate that for the so called “newcomers”, weather and climate has mostly been experienced in places other than Kerourien. Newcomers may have experienced weather and climate, but in diverse ways, associated with their diverse origins. Moving from the Comores, entails seafaring, flying, and having lived in intense relationship with the Indian Ocean, its power and associated weather patterns. This experience is not easy to relate to the experience of those migrating from Mali who have experienced rainfall deficits at the margin of the Sahara desert. The relatively mild and humid climate of Kerourien may be seen as a relief for some, and as nuisance for others. The limited time some have spent in Kerourien may simply not allow for much of a relationship with the local weather to exist.

In order to further our inquiry, we tried to identify traces, even faint ones, of weather or climate information. This led us to reorganize the corpus (Table 3) in terms of weather and climate issues. Three ways of grouping the associated narrations emerged from this reanalysis: climate/weather information sources; manifestation of climate or weather in one of the dominant narratives; and reference made to places where climate issues may be radically different than in Kerourien and that are seen as central to the life experiences of the narrators.

4.3.1 What are Kerourien’s current climate information sources?

Residents of the Kerourien neighbourhood have access to mass media and their coverage of weather (mostly through weather forecasts, or coverage of extreme events, mainly storms) and climate issues. They also have access to information sources produced by authorities (such as information booklets about Brest’s climate action plan) or by social action NGOs (such as information booklets developed by an NGO centred on fighting for housing rights and covering the Paris Conference of Parties in 2015). They thus have access to the dominant techno-scientific discourse on climate change. Very little is available on their everyday concerns, on the places they hold dear, be it Kerourien or their hometown in Syria, Mali, Morocco or Haiti. Very little is even said about climate change impacts on water quality in the Bay of Brest.

One striking finding from our analysis of the collected narratives is the inability of dominant climate change discourse to significantly influence local narratives. Not that weather and climate are absent, they simply take another form.

4.3.2 Traces of weather and climate in Kerourien’s narratives.

We identified several traces of weather and/or climate in the narratives we collected. First, living conditions in Brest are very connected to the omnipresence of rain, drizzle, and water in a way that resonates with the situation in Bergen (Bremer et al., 2020). There is “mud” in the barracks, construction sites are dangerous because of “mudslides” and “slippery conditions.” Rain is associated with grey skies. Coming from warmer climes:

“It’s not the cold that bothers me the most. It’s the gray. I don’t like fall. It’s too wet, too gray”.

Nowadays the weather in Kerourien, for its residents, is relative to elsewhere, places that, thanks to the filters of nostalgia, are characterized by milder conditions, blue skies, easy living. The traces of weather and climate we found are not often from “over here”. For many now, Kerourien is not necessarily associated with their future. In the future, climate and weather encounters will occur elsewhere.

The framing of the weather in Kerourien per se follows the enthusiasm-to-regret cycle of the “The first generation laid low. The second generation crashed. The third is restless” narrative:

“When I arrived there was snow. I was coming out of the oven. From a hot climate up to 50 °C in February. And I was going into the refrigerator. From hot there to cold here. I was happy to see the kids playing with the snow.”

The climate of the emotions guides the judgement of the external climate, that of rain, cold and grey skies, shaping a “sense of climate.”

When the future is envisioned in Kerourien, we interpret it through a climate lens as a future that will be the product of the fight between forces of progress and reactionary forces, with Kerourien on the side of progress:
“In 2050, I’m seeing […] that we push further the respect for the environment. […] So let’s go green. Let’s be truly aware, let it be a part of our way of life. […] I see capitalism swelling and I don’t know in 30 years where we’ll be ……”

We observed that, while rarely present in explicit terms, weather and climate are part of the background of Kerourien’s narratives. From here, we turned to connecting to climate change issues through these stories. These stories, their material, ethical, and emotional dimensions have been recognized as important by community members. For the climate service co-production team, they constituted an escape route away from the dominant technocratic climate change discourse that is currently a non-starter for Kerourien residents.

5 Discussion
5.1 Beyond substance: Empowerment

By engaging in the process of jointly creating an art form and gathering data while preparing an event with local significance, we managed develop trust and establish mutually beneficial relationships between Kerourien community members and the trans-disciplinary research team, even leading to the co-production of climate services.

Vincent et al. (2018) stress that climate services are more than information alone. They are about producing long-term relationships and trust. In Kerourien the situation was slightly different, as we were not in a position to engage in a relationship by talking about climate change (see Krauss, 2020 for another instance of such a situation). Our challenge stopped at simply engaging in a relationship, let alone one built on climate concerns. We were in a situation where we wanted to “prime the pump” of a co-production process. Trust-building in our case study was a condition for co-producing climate services, and a product of our process. This intervention primed not only the co-production of climate services, but also a desirable positive feedback loop.

Another important observation relates to mutual learning, in the sense of learning to do things together (see Chouinard and Perron, 2002, Vincent et al., 2018). One key element that stood out in this experiment was the way in which the transdisciplinary and scientific skills of the research team were put to work for non-scientific purposes, namely the preparation of a neighbourhood’s anniversary celebration. Learning and trust-building were deeply intertwined for this. As our case shows, those on the science-side of co-producing climate services may render other services to the communities with whom they engage. Through this observation we see that co-producing climate services may actually be more about transdisciplinary science than about climate science. This suggests climate service co-production is following the example of sustainability science (see Mauser et al., 2013, Polk, 2015) but with a narrower, and much more local focus.

Finally, we collectively identified a limited set of narratives encapsulating what Kerourien residents had to say about themselves. In the words of some of the participants, this process, and the associated les Belles histoires, did put the Kerourien community back on track to becoming whole again. These stories constitute what the residents all share, at least for the time being. Having this renewed common ground is making them stronger than before our co-production intervention. A stronger community will be able fare better in the face of climate change. For our purpose of co-producing climate services, a stronger community will be a stronger partner, more reliable, and more aware of its actual needs. Not only did we develop trust with the Kerourien community, we all became stronger in the process, stronger for engaging in substantive work, stronger for taking stock of the substantive effects of our intervention.

Climate services are often assessed against their usability. Our research demonstrates this is not sufficient; the procedural benefits of co-producing climate services should be assessed as well. Context dependency will make such evaluation particularly challenging. This should not prevent climate service funders from taking stock of the wider social benefits the actions they support bring to co-producing partners.

5.2 Getting the priorities straight: adopting local values and contributing to justice.

The initial step of our co-production process allowed us to anchor our actions in local stories and relate directly to our partner community and its values. This allowed us to free the co-production team from dominant (and technocratic) climate change and adaptation discourses. Rather than adopting the prevailing culture represented in the climate literature available to the community, we adopted narratives associated with everyday life, hardships, the joys and pain of migration, and engagement for greater justice.

Through the lens of priority setting, climate service co-production has much to learn from participatory research and participatory planning. For instance, one aspect we did not address explicitly in this experiment in co-production was that of gender. In the realm of participatory research there many analyses showing that one should be explicit about gender and other identity dynamics at play – the “Whos voices? Whose choices?” questions that need to be answered (Cornwall, 2003). In the case of climate service co-production, the dominant discourse may totally blind co-producers with its technocratic, mainstream scientific stance; it seems too often to consider gender, race, class, and other social categories, as not necessarily part of what deserves attention. Within the realm of climate change, our results point to “the importance of (re)politicizing co-production by allowing for pluralism and for the contestation of knowledge” (Turnhout et al., 2020, pg. 15). As Krauss (2020) writes, “a focus on narratives shifts the attention from the impact of climate on society to the myriad of entanglements between human and non-human actors in a changing climate” (pg. 3). This shift in focus will allow us to ground further steps of climate service co-production in the priorities of those most vulnerable to the vagaries of the world.

5.3 Extending the geographical boundaries of empowerment and the fight for justice: revisiting the concept of place

Finally, paying attention to local stories and the role of weather and climate within these stories led us to the realization that locally place-based climate service co-production may actually entail working with multiple locations and associated issues. Co-production challenged our routines (Krauss, 2020). It pushed us to reconceptualize “place” as extending beyond the circumscribed location
where our co-production partners were living at the time. This opened up a rich perspective in terms of climate service co-production. In the course of our work, place became a relational concept, the definition of which belonged to the members of the co-producing community – what mattered what their sense of place (see Stedman, 2003). Sense of place is an integrative concept (Saarinen et al., 1982), and it carries both the characteristics of the environment and of the individual or group perceiving it. Sense of place connects with place attachment, and others have shown, as we observed, how memory is critical for migrant populations’ relationships to places (Rishbeth and Powell, 2013). By adopting this extended concept of place, the co-production team had to accept that knowledge transcends national boundaries, and that time-scales may relate to individual trajectories of past, present, and hoped-for futures. Huot and Libert-Rudman (2010), analyzing the interplay of occupation, place, and identity, propose that individuals perform their identity in relation to place and occupation. This resonates with our results and the dynamic nature of the judgement individuals expressed of the place where they live and of the (now imagined) place they once left, and to which they long to return. The status of place shifts through time, as a manifestation of changes in context, occupation and identity. Place-based co-produced climate services in such situations need to be reinvented in order to offer information that is dynamic, reconfigurable, and multi-layered. This is another central challenge for the climate service co-production research agenda.

6 Conclusion

What did we learn by reaching out to a community for whom climate issues were not central? We learned that things are not what they seem; at least when one is “co-producing place-based climate services for action.” “Places” have multiple meanings, are not bounded, and depend very much on personal experience and mobility. The conceptualization of climate services, and the potential for co-production, depends on the reference discourse one mobilizes. Climate services may generate many things: from the reproduction of a dominant liberal narrative emphasizing individual responsibility to a unique opportunity to contribute to justice and the redistribution of power. And “action” in this case entailed being mobilized to co-produce an anniversary celebration and the corresponding theater play, along with a stronger partner community as a result. If we return to our original line of questioning, “how and with what results might place-based climate service co-production be enacted within a community for whom climate change is not a locally salient concern?”, we have some answers.

How? In order to engage with a community in a climate service co-production exercise despite the community’s seeming lack of interest in climate issues, we took the long way around. We engaged in relationship-building and making our skills available for many purposes while progressively connecting with the community, its concerns, interests, and finding intersections with climate issues. We were transparent in terms of our interest in climate concerns, yet we kept that agenda on the back burner while accepting to be mobilized ourselves around the community’s more pressing issues.

With what results? From the development of a trust-based relationship with the community to the building of a stronger community, this experiment allowed us to question the dominant paradigm that may be crippling for climate service co-production: the assumption that climate and weather are evident parts of the fabric of everyday life; that it is not always necessary to be explicitly focused on climate to be able to co-produce climate services.

These three points lead us to question the definition of climate services we used at the onset of our work and as a starting point for this paper. Paraphrasing Vaughan and Dessai we are inclined to propose a working definition of climate services that will need further ground-truthing:

The aims of climate services are to provide people and organizations with timely, tailored climate-related knowledge and information that they can use to reduce climate-related losses and enhance benefits, including the protection of lives, livelihoods, and property, as well any process designed to reinforce the ability to:

(a) identify individual and collective knowledge needs,
(b) mobilize existing knowledge, formal and informal, and
(c) turn such knowledge into action, at the individual, and collective levels.

These conclusions seem to indicate that it might be worth considering integrating climate service co-production into all community development activities. Preparing for a changing climate and preparing the requisite knowledge base should be part of the everyday routines of local development, especially in neighbourhoods with a long list of seemingly more urgent concerns. They might be the hardest hit by climate change.

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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Appendix A. Supplementary data

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