Climate Narrative Music:
An exploration of composition and performance practice

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Abstract

What is climate change? It is possible to understand climate change as a scientific phenomenon, a political battlefield, and as a policy challenge to be addressed, among many other perspectives. Climate communications expert George Marshall argues that climate change "…can have multiple interpretations but exists only in the form that people choose it to have." I suggest that it is essential that we engage with the changing climate as a *narrative* which is directly relevant to our personal, family, and community lives. Furthermore, artists and cultural agents have a vital role in weaving this story into our social discourse, setting up spaces for grappling with the reality of climate disruption, and envisioning positive ways forward through the climate crisis. In this paper, I examine ways of "knowing" climate change through the lens of narrative and music. To illustrate one approach to engaging with climate change as a story and as a ground for artistic expression, I discuss my research-creation work carried out for my doctorate of music at McGill, for which I wrote and performed five musical pieces which incorporate recorded personal narratives of the changing climate. I suggest that this approach offers a "holistic" methodology for enabling individuals, communities, and audiences to enter into a closer relationship with the changing climate.

Résumé

Qu'est-ce qu'on entend par "changements climatiques" ? Fruits de nombreuses batailles politiques, les changements climatiques sont plus souvent qu'autrement observés en tant que phénomène scientifique et donnent lieu à des défis sur le plan de la réglementation. L'écologiste George Marshall soutient que les changements climatiques « …sont matière à interprétations et n'existent, en réalité, que dans la définition que chacun en donne. » Je prétends qu'il est essentiel d'aborder les changements climatiques en tant que *récit de vie* touchant les sphères personnelle, familiale et de la vie en communauté. De plus, les artistes et les représentants du domaine culturel, qui mettent en place des espaces de création, permettent de mieux comprendre les perturbations du climat, et à ce titre, ils jouent un rôle vital dans l'intégration de cette réalité au discours social ; des façons constructives d'affronter la crise climatique sont ainsi envisagées. Dans ce document, je cherche à "connaître" les changements climatiques à travers les récits de vie et la musique. Pour illustrer cette approche narrative et artistique des changements climatiques, je présente mon travail de recherche-création réalisé dans le cadre de mon doctorat en musique à l'Université McGill. Au cours de ce travail, j'ai écrit et joué cinq pièces musicales qui contiennent des enregistrements de récits personnels sur les changements climatiques. Mon hypothèse est que cette démarche offre une méthodologie « holistique » qui permet aux individus, aux communautés et au public en général d'aborder de plus près les changements climatiques.

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Introduction: My journey into climate change narrative and music

My involvement with climate change dates to 1988, the year that NASA scientist James Hansen testified before the US Congress that the record heat that year was almost certainly influenced by a sharp rise in human-produced greenhouse gases caused by the burning of fossil fuels. I remember the intense heat of that summer and knowing that it was what global warming "felt" like. Much later, I heard composer Steve Reich's piece *Different Trains*, which is built around recorded voice samples from two groups of interviewees. The piece struck me for its emotional impact and for how it powerfully illustrated the Holocaust by fusing music and personal testimony. Reflecting on my own intense response to the reality of global climate change, I decided to begin writing and performing music which incorporated recorded reflections of people speaking about their responses to the changing climate. From these efforts, I created Climate Stories Project, an educational and artistic forum for sharing personal and community stories about climate change. Since 2013 I have been recording and sharing personal stories from people around the world speaking about their responses to the changing climate in their home regions. In addition, I have been facilitating educational workshops in which high school and college students share their own responses to climate change and interview guest speakers, such as Indigenous elders and natural resource professionals, about theirs. In 2016 I decided to further develop the musical aspects of this project and enrolled in the Doctorate of Music program at McGill University to do so. For my research-creation work at McGill, I studied musical works of other composers who engage with climate change, as well as works which incorporate recorded voice samples. I wrote and performed five new pieces which incorporated spoken climate change narrative: three for solo double bass, one for alto voice and double bass, and one soundscape composition.

My research-creation goals were to:

1) Better understand ways of "knowing" climate change through personal narrative and musical creation;
2) Explore methods for writing and performing music which incorporates recorded voice samples;
3) Create "climate story" works for solo double bass performance and perform these pieces in a workshop format combining music, spoken presentation, and climate story sharing, with the goal of increasing participant engagement with climate change.

I also explore some larger-scale research questions in this paper:

1) How can we think about and share our experience of climate change as a present-day personal and community story?
2) How can this framework increase public engagement with climate change?
3) What role does Indigenous knowledge play in re-framing public understanding of climate change?
4) Can "climate change music" help us re-negotiate our relationship with the non-human world?
5) How can I construct and implement a "holistic" research-creation methodology, which encompasses story sharing, educational workshops, interview recording, artistic creation using climate stories, performance, and community resilience-building in the face of rapid climate change?

Chapter 1: The climate crisis, public engagement, and climate change music

> *Our current environmental crisis is not the result of incomplete scientific understanding or contentious politics but rather is a failure of imagination and creativity.*[1]

1.1 Climate change and public engagement

Climate change has been recognized as an urgent global crisis, with the scientific community arguing that the industrialized world has only until 2030 to drastically reduce fossil fuel use or risk pushing the climate system past tipping points beyond which it will become irrevocably altered.[2] Unfortunately, this announcement has largely failed to galvanize action. For decades, large-scale responses to climate change have followed a model in which individual countries make voluntary pledges to reduce their greenhouse gas emissions by certain percentage points by benchmark years, with at best limited success. At present, the landmark agreement made in Paris in 2015 to limit global temperatures to no more than two degrees Celsius over pre-industrial levels is in jeopardy of unraveling, as major greenhouse gas emitters (notably the US) and notable fossil fuel producers (notably Saudi Arabia) are hindering progress by pulling out of the agreement or scaling back commitments.

Why is it that despite widespread media coverage, educational campaigns, and professed commitment by politicians, the response to the existential threat of the climate crisis has received a response wholly inadequate to the challenge? This question has received a great deal of thoughtful analysis by sociologists, economists, political scientists, psychologists, and communications experts.

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[1] Allen, Aaron S. "Ecomusicology: Ecocriticism and musicology." *Journal of the American Musicological Society* 64, no. 2 (2011): 391-394.

[2] Tollefson, Jeff. "IPCC says limiting global warming to 1.5 C will require drastic action." *Nature* 562, no. 7726 (2018): 172-173.

Among the many roadblocks to systemic change are a sustained disinformation campaign, financed by the fossil fuel industry, to sow doubt about the reality of anthropogenic climate change; a global economic system which requires perpetual growth to continue functioning; and a host of psychological mechanisms for ignoring or minimizing the severe threat that climate change presents.[3]

Many scholars argue that a significant part of the disconnect arises from a lack of public engagement with the climate crisis. Joanna Wolf and Susan Moser define engagement as "a personal state of connection with the issue of climate change, in contrast to engagement solely as a process of public participation and policy making." Wolf and Moser demonstrate that one-way communication about climate change, among other issues, does not lead to engagement, and leaves the receiver of information feeling powerless and disconnected. Along with other scholars, they argue that dialogic and cultural narratives (stories) can motivate personal connection with climate change and with others concerned about it.[4]

1.2 Climate change music

Could part of the disconnect between urgency and action be that climate change is largely absent from artistic and cultural realms? In 2005 author and climate activist Bill McKibben posed this paradox:

> *If the scientists are right, we're living through the biggest thing that's happened since human civilization emerged. One species, ours, has by itself in the course of a couple of generations*

[3] The following sources provide a good overview of the factors inhibiting action on climate change: Klein, Naomi. *This changes everything: Capitalism vs. the climate*. Simon and Schuster, 2015.; Marshall, George. *Don't even think about it: Why our brains are wired to ignore climate change*. Bloomsbury Publishing USA, 2015.; Gelbspan, Ross, and Tim O'Riordan. *The heat is on: The high stakes battle over Earth's threatened climate*. Reading, MA: Addison-Wesley, 1997.

[4] Wolf, Johanna, and Susanne C. Moser. "Individual understandings, perceptions, and engagement with climate change: insights from in-depth studies across the world." *Wiley Interdisciplinary Reviews: Climate Change* 2, no. 4 (2011): 547-569.

> *managed to powerfully raise the temperature of an entire planet, to knock its most basic systems out of kilter. But oddly, though we know about it, we don't know about it. It hasn't registered in our gut; it isn't part of our culture. Where are the books? The poems? The plays? The goddamn operas? Compare it to, say, the horror of AIDS in the last two decades, which has produced a staggering outpouring of art that, in turn, has had real political effect. I mean, when people someday look back on our moment, the single most significant item will doubtless be the sudden spiking temperature. But they'll have a hell of a time figuring out what it meant to us.*[5]

Since McKibben wrote these words in 2005, there has been an explosion of artistic works that address the changing climate, at least partly with the goal of increasing public awareness of and engagement with the issue.[6] While artistic approaches to climate change are most developed in literature, photography, and the visual arts, the growing field of "climate change music" is catching up fast.

An example of music from this field is John Luther Adams' 2013 piece "Become Ocean," in which the composer references the surging seas which are slowly engulfing coastlines as climate change accelerates. While the waves of orchestral sound in "Become Ocean" are evocative of a restless sea, Adams has stated that he is not interested in telling a story or painting a picture of a particular place, but rather wants to encourage listeners to pay close attention to the wonders of the natural world and the dramatic changes underway:

> *…it's my hope that you can listen to this music without knowing anything about what the composer had in mind, including maybe even the title, and find yourself, or lose yourself, immersed in this music and have a real experience, something that touches you and moves you. At the same time…most of us these days, think a lot about the future of the present state of the*

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[5] McKibben, Bill. "What the Warming World Needs Now Is Art, Sweet Art." Grist. March 02, 2015. https://grist.org/article/mckibben-imagine/

[6] see www.artistsandclimatechange.com for a sampling of current climate art practitioners.

> *Earth, the future of the human species and specifically about climate change. As I composed Become Ocean, I had in my mind and my heart this image of the melting of polar ice and the rising of the seas. All life on this Earth emerged from the ocean. If we don't wake up and pay attention here pretty soon, we human animals may find ourselves once again becoming ocean sooner than we imagine.*[7]

Another approach to musically depicting climate change is through the lens of the changing soundscape. The soundscape can be defined as the totality of sounds which are expressed by a place, city, or geographic region. Composer R. Murray Schafer, in his book *The Tuning of the World,* details how an increasingly noisy and "lo-fi" soundscape is a result of uncontrolled urban development. Like composers John Cage and Pauline Oliveros, Schafer considers active listening a vital means for people to connect to natural and human-built environments.[8] Following in Schafer's footsteps, composer and sound researcher David Dunn has "aestheticized" soundscapes changing rapidly from environmental threats. Using homemade microphones, Dunn recorded the sounds of bark beetles in the interior of dying pinyon pine trees in New Mexico, and composed soundscapes using layers of these recorded sounds for his 2006 album *The Sound of Light in Trees*. The rapid spread of the pine beetle and the resultant tree mortality is being triggered by warmer and drier temperatures resulting from climate change, so in a sense Dunn is recording the "sound" of climate change.[9] Another approach to soundscape composition is by artist Jacob Kirkegaard, who explores climate change's impact on glaciers in his sound installations "Melt" and "Isfald." For these installations, Kirkegaard recorded different stages of melting ice in Greenland, which are played through an array of speakers

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[7] Rath, Arun. "An Inviting Apocalypse: John Luther Adams on 'Become Ocean'" 2014. NPR. http://www.npr.org/sections/deceptivecadence/2014/09/28/350911062/an-inviting-apocalypse-john-luther-adams-on-become-ocean.

[8] Schafer, R. Murray. *The soundscape: Our sonic environment and the tuning of the world.* Simon and Schuster, 1993.

[9] Dunn, D. Liner notes of The Sound of Light in Trees. 2006. www.acousticecology.org/dunn/solitnotes.html

in gallery spaces. Sounds include glaciers calving, icebergs creaking against one another, and dripping meltwater.[10]

Some composers directly reference the changing climate by using ice as an instrument or sound source. Composer and instrument maker Cheryl E. Leonard, in her 2013 piece "Selections from Antarctica: Music from the Ice," plays a range of amplified natural objects she collected during a residency at a research station in Antarctica, such as penguin bones and rocks, while icicles suspended above the stage melt into amplified beakers, providing a complex rhythmic and melodic background.[11] In a similar approach, for Matthew Burtner's piece "Syntax of Snow," performers manipulate melting snow in amplified bowls according to precisely written notation. As the piece progresses, the sound of the snow notably changes as it melts, providing a musical representation of the changing climate.[12]

An established compositional approach is the sonification of scientific data such as changes in global temperatures or of atmospheric carbon dioxide levels. For example, composers may assign pitches or rhythms to data sets such as average global temperatures over time. A simple example is by student composer Daniel Crawford in his piece "A Song of Our Warming Planet," for which he used global temperature data from the last 130 years and assigned a pitch for cello corresponding to each year. One can see the visual correspondence between a score of the work and a graph displaying the rise in global temperatures from 1850 to the present. Listening to the piece, one can

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[10] Kirkegaard, Jacob. "Melt" (2015) http://fonik.dk/works/melt.html

[11] Leonard, Cheryl E. "Selections from Antarctica: Music from the Ice." 2013. Exploratorium. https://www.youtube.com/watch?v=FvGycuSia9I&t=2240s

[12] Burtner, Matthew. "Climate Change Music: From Environmental Aesthetics to Ecoacoustics." *South Atlantic Quarterly* 116, no. 1 (2017): 145-161.

very clearly "hear" the dramatic heating of the earth.[13]

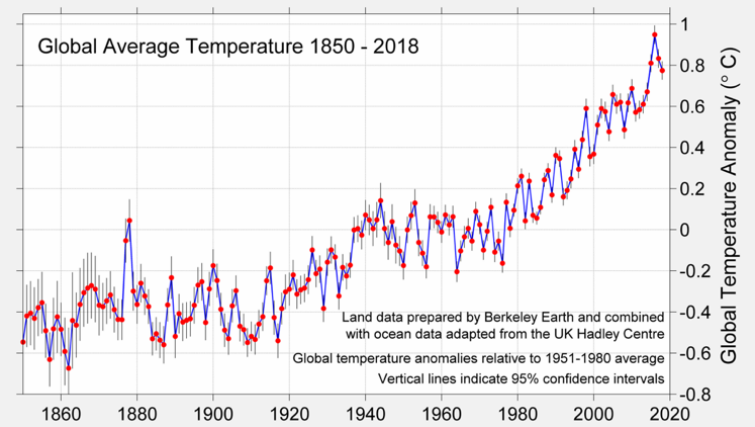

Figure 1. Global Average Temperature Anomaly from 1850-2018, Berkeley Earth.

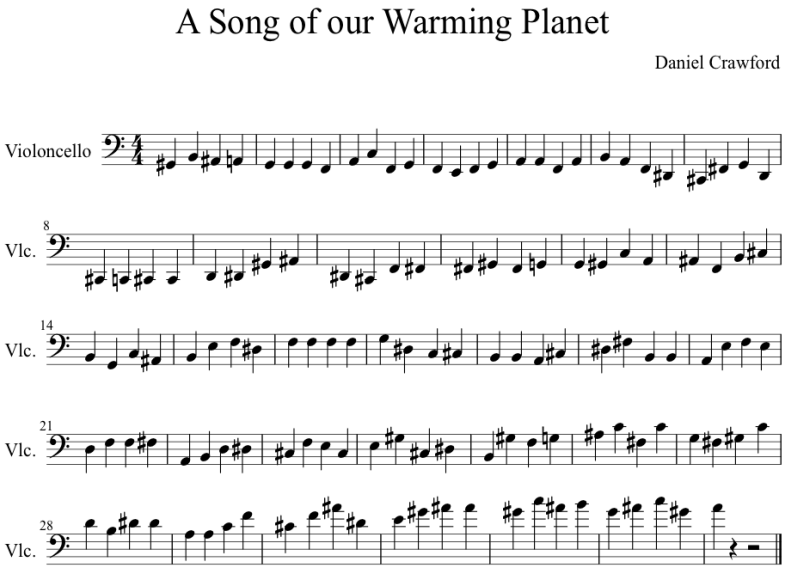

Figure 2: Crawford, Daniel. "Song of our Warming Planet." 2011.

[13] Crawford, Daniel. "Song of our Warming Planet." 2011. https://www.youtube.com/watch?v=5t08CLczdK4

Composer Matthew Burtner also employs data sonification to express environmental change. Burtner's multimedia opera *Auksalaq*, an Iñupiat word meaning "melting ice," depicts the rapidly changing world of the Arctic through data sonification, spoken and sung voices, video, and interactive feedback with the audience through a computer platform called NOMADS.[14] Burtner sonifies the data in a less "didactic" way, so that one can appreciate the works on their own artistic merits without necessarily being aware of the data behind their creation.

One may question the effectiveness of the recent crop of climate change music in increasing public engagement with the climate crisis. Does hearing sonified data of rising global temperatures lead to greater engagement than viewing a graph of that data? Does listening to a piece of music with an evocative, climate-related title help one relate to climate change in a more direct way? Furthermore, what does the preponderance of data-driven musical works say about our relationship to the climate crisis? Do composers of these works use scientific data to keep climate change at a manageable psychological distance? While fully answering these questions is beyond the scope of this paper, I argue that it is important to examine how our way of "knowing" climate change through music and art influences public engagement with the climate crisis.

1.3 The climate narrative framework

I suggest that a narrative framework for engaging with climate change is a productive starting point for creating and performing climate change music. Climate communications expert George Marshall argues that the standard mental frames for understanding climate change, such as "environmentalist," "regulatory," and "future-oriented," among others, limit the possibilities for

[14] Burtner, 2017.

engaging directly with the changing climate and keep it out of the cultural and social sphere. Marshall writes that "…what truly engages the emotional brain are personal stories, and what convinces us of the trustworthiness of the communicator is our own evaluation of his or her commitment."[15]

A story frame means that individuals understand, relate to, and talk about the changing climate within the narrative of their own personal lives. This frame is built from life experience, personal observation, sensory details, and emotional responses to climate change, elements which are lost when climate change is understood and expressed solely as scientific data or through the lens of political battles. The story frame can be understood as an "oral history" approach to climate change, in which the direct experience of people in their home places compliments (or competes with) the "official" discourse of climate change as a global phenomenon expressed in parts per million of carbon dioxide or via international emission reduction treaties. It can be argued that this oral history approach is in some ways more accurate than the global perspective, as it is developed from expressive details of language, including tone, volume, and cadence, which are lost in scientific papers, treaty agreements, or in written descriptions of the impacts of climate change.[16]

However, the transition from climate change as an "external" phenomenon to a personal or community story is not a straightforward affair. Analogous to the efforts of oral historians to establish that spoken testimony is as valid as written sources, proponents of a story frame for engaging with climate change face a challenge in arguing that personal accounts of the changing climate should be taken as seriously as published scientific papers. At a basic level, there is a

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[15] Marshall, George. *Don't even think about it: Why our brains are wired to ignore climate change*. Bloomsbury Publishing USA, 2015. pp. 124-126.

[16] For examples of this dynamic, see: Portelli, Alessandro. "What makes oral history different." In *Oral history, oral culture, and Italian Americans*, pp. 21-30. Palgrave Macmillan, New York, 2009.

legitimate argument that climate, in contrast to weather, is a statistical abstraction, and therefore climate change cannot be experienced as a personal event. However, scientists have demonstrated how extreme weather events, which are directly experienced, increasingly bear the "fingerprint" of climate change.[17] On the ground, the effects of the changing climate, such as intense droughts, flooding, and agricultural failure, are readily observable, especially by those living in communities dependent on direct interaction with natural resources.[18] Therefore, for many people, climate change is shifting from an abstract, future-oriented phenomenon to an element of everyday life that can be seen, felt, and described to others.

1.4 Climate narrative music

Narrative approaches to knowing climate change present a counterbalance to the dominance of data-driven or political framings of the issue. Similarly, narrative approaches to expressing climate change in music present a contrast to the preponderance of data sonification compositional techniques, providing a way for listeners to engage with the changing climate through human stories. One example of this narrative approach is from Laurie Anderson's 2018 recording *Landfall*, which features music written for the Kronos String Quartet interspersed with sections of Anderson's spoken reflections of her experience of Hurricane Sandy, which flooded her New York City home in 2012. The piece "Everything is Floating" features Anderson reciting the following passage:

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[17] Rapacciuolo, Giovanni, Sean P. Maher, Adam C. Schneider, Talisin T. Hammond, Meredith D. Jabis, Rachel E. Walsh, Kelly J. Iknayan et al. "Beyond a warming fingerprint: individualistic biogeographic responses to heterogeneous climate change in California." *Global change biology* 20, no. 9 (2014): 2841-2855.

[18] Savo, V., D. Lepofsky, J. P. Benner, K. E. Kohfeld, J. Bailey, and K. Lertzman. "Observations of climate change among subsistence-oriented communities around the world." *Nature Climate Change* 6, no. 5 (2016): 462.

> *After the storm, I went down to the basement and everything was floating…all the things I'd carefully saved all my life, becoming nothing but junk. And I thought, how beautiful, how magical, and how catastrophic.*[19]

Anderson's distillation of climate change into a very personal experience of loss offers a musical approach for accessing emotional responses to environmental deterioration. I am reminded of the *Work Which Reconnects*, a workshop and training model developed by environmental activist Joanna Macy, which encourages participants to access their anger and grief as well as their ambivalence over their role in environmental destruction.[20] Anderson's climate narrative music also recalls the concept of *solastalgia*, a feeling of loss stemming from environmental change in people's home places.[21]

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[19] Anderson, Laurie. "Everything is Floating" *Landfall*. Nonesuch Records, 2018.

[20] Macy's work is now called "The Work That Reconnects" but it originally was defined as the practice outlined in the following book: Macy, Joanna, and Molly Young Brown. *Coming back to life: Practices to reconnect our lives, our world*. Gabriola Island, BC: New Society Publishers, 1998.

[21] Albrecht, Glenn, Gina-Maree Sartore, Linda Connor, Nick Higginbotham, Sonia Freeman, Brian Kelly, Helen Stain, Anne Tonna, and Georgia Pollard. "Solastalgia: the distress caused by environmental change." *Australasian psychiatry* 15, no. sup1 (2007): S95-S98.

Chapter 2: Methodology

In this section I will discuss the methodology I am developing for creating and performing climate narrative music. It is important to note that this is not a prescriptive methodology but rather a loose framework for my approach to research and artistic creation. Ultimately, my goal is to develop a "holistic" methodology which encompasses interviewing, music creation, and performance in the context of presentations, educational workshops, and community engagement initiatives. The work I have done for my doctoral degree can best be thought of as a preliminary exploration of this approach. To demonstrate approaches to this methodology, I will later detail several "case studies" of research-creation projects which I carried out during my studies at McGill.

2.1 The interview process

The interview stage of my research/creation methodology falls under the initiative Climate Stories Project (www.climatestoriesproject.org), a forum for sharing personal and community stories about climate change. For Climate Stories Project, I and other team members conduct and record interviews with people speaking about their observations of and responses to the changing climate. Additionally, we facilitate educational workshops in which students discuss their responses to climate change, practice interview skills, and interview guest speakers about their experiences with the changing climate. The goal of the project is to encourage a deeper engagement with the climate crisis for students and participants throughout the world.

For the current project, I obtained ethics approval from the McGill Research Ethics Board Office (Appendix A). I explained the project in detail to interviewees, including the editing process, in which I condense the full interview into a 2-3-minute recording which is then shared online. I discussed with interviewees how I select and join segments of their interview to create a more

condensed narrative flow, and how I use small fragments of their interview in the music pieces. Interviewees signed a consent form (Appendix B) to allow me to edit their interviews, share them on www.climatestoriesproject.org, use recorded samples from their interview in the musical pieces, perform the pieces publicly, and record them. A more detailed discussion of the ethics of editing interviews and using samples from them as material for musical pieces can be found in the discussion section of this paper.

2.1.2 Selecting interviewees

For the current project, I chose the interviewees via mutual contacts, made during my studies at McGill or through my work with Climate Stories Project. I included a group of interviewees from widely different geographic regions and from varied cultural backgrounds, with the goal of demonstrating how climate narratives are unique to each interviewee but also contain common elements of attachment to place, observations of change, and discussions of positive ways forward.

Anyone can be interviewed about their "climate story." However, I have found that the richest and most engaging stories are told by those with a long-term familiarity with their local environment, and the ability to relate detailed observations of the effects of the changing climate on their home places. Often, these stories come from members of Indigenous communities, who typically have generational knowledge of their local environment, including weather conditions, animal migration patterns, and timing of plant flowering, among other factors. This finding is reflected in the substantial literature documenting the observations by Indigenous elders of local impacts of the changing climate. Research details Indigenous community members' observations of and responses

to climate change in a variety of realms, such as food security,[22] mental health,[23] and traditional music.[24] Many studies relate Indigenous observations of climate change as personal and community narrative embedded within storytelling traditions.[25] Not coincidentally, a large number of these studies have been carried out in Arctic communities. The Arctic is undergoing especially rapid climate change, and its effects are more noticeable there compared with other regions of the world.[26] For the current project, I interviewed two Indigenous community members: Inuit elder John Sinnok of Shishmaref, Alaska, and Membertou, Cape Breton resident Clifford Paul.

2.1.3 Interview format

The interviews for this project follow a semi-structured format, a qualitative research method used for gaining detailed information from interviewees in a "conversational" approach.[27] This format encourages interviewees to speak about climate change and how it intersects with their personal and community lives without feeling compelled to give prepared responses. While similar questions are used for each interview, the format is adaptable to the responses and topics that come up spontaneously during the interview. The interview questions are structured around three general

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[22] Ford, James D. "Vulnerability of Inuit food systems to food insecurity as a consequence of climate change: a case study from Igloolik, Nunavut." *Regional Environmental Change* 9, no. 2 (2009): 83-100.

[23] Willox, Ashlee Cunsolo, Sherilee L. Harper, James D. Ford, Victoria L. Edge, Karen Landman, Karen Houle, Sarah Blake, and Charlotte Wolfrey. "Climate change and mental health: an exploratory case study from Rigolet, Nunatsiavut, Canada." *Climatic Change* 121, no. 2 (2013): 255-270.

[24] Sakakibara, Chie. "'No whale, no music': Inupiaq drumming and global warming." *Polar Record* 45, no. 4 (2009): 289-303.

[25] Holm, Lene Kielsen, Henry Huntington, Joe Mello Leavitt, Andrew R. Mahoney, and Margaret Opie. *The meaning of ice: People and sea ice in three Arctic communities*. Edited by Shari Fox Gearheard. Hanover, NH: International Polar Institute Press, 2013.; Sakakibara, Chie. "'Our home is drowning": Iñupiat storytelling and climate change in Point Hope, Alaska." *Geographical Review* 98, no. 4 (2008): 456-475.; Krupnik, Igor, and Dyanna Jolly. *The Earth Is Faster Now: Indigenous Observations of Arctic Environmental Change. Frontiers in Polar Social Science.* Arctic Research Consortium of the United States, 3535 College Road, Suite 101, Fairbanks, AK 99709, 2002.

[26] IPCC Climate Change 2007: The Physical Science Basis (eds Solomon, S. et al.) (Cambridge Univ. Press, 2007).

[27] Longhurst, Robyn. "Semi-structured interviews and focus groups." *Key methods in geography* 3 (2003): 143-156.

themes, as expressed in the following prompts:

1) *Introduce yourself and describe a feature or your local environment which has meaning for you.*

This question encourages interviewees to tap into their connection with their home place, which is an important step for people to engage with climate change as a meaningful personal issue. Research demonstrates that strong emotional responses to, and engagement with, climate change is predicated on personal connection to "objects of care," which can include local environmental or community features.[28] Attachment to place also strongly determines cultural and therefore narrative responses to climate change.[29] UK-based climate communications organization Climate Outreach suggests that a crucial part of increasing public engagement with climate change is allowing people to recognize climate change as an issue relevant to their own lives, and to develop a "vocabulary" to speak about climate change as a personal and community issue.[30]

2) *Reflect on the changes in your local environment which may be a result of climate change. How did you feel when you first recognized that climate change was impacting your life?*

The second prompt addresses how the interviewee is observing and responding to the changes occurring in their local environment. An important goal of the project is to encourage interviewees (and listeners of the music pieces composed from the interview material) to connect emotionally to climate change via their life experience. Research argues that emotional connection, especially empathy, is a prerequisite for sustainable human-nature relationships. There is also evidence that the lack of emotional engagement presents barriers to engagement with the environment and

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[28] Wang, Susie, Zoe Leviston, Mark Hurlstone, Carmen Lawrence, and Iain Walker. "Emotions predict policy support: Why it matters how people feel about climate change." *Global environmental change* 50 (2018): 25-40.

[29] Adger, W. Neil, Jon Barnett, Katrina Brown, Nadine Marshall, and Karen O'brien. "Cultural dimensions of climate change impacts and adaptation." *Nature Climate Change* 3, no. 2 (2013): 112.

[30] Shaw, Christopher, and Adam Corner. "Using Narrative Workshops to socialise the climate debate: Lessons from two case studies–centre-right audiences and the Scottish public." *Energy research & social science* 31 (2017): 273-283.

ecosystems suffering from environmental disruption.[31]

A key aspect of the interviewing process is to provide a space for the interviewee to engage with the sensory richness of climate change. In other words, how does climate change feel, look, and sound? This aspect is especially important as climate change communication can become mired in abstraction, such as fears about future environmental decline or levels of carbon dioxide in the atmosphere. Anchoring climate change in personal lived experience and narrative helps participants and listeners successfully engage with this overwhelming issue.[32]

3) *Describe your role in creating a positive response to climate change.*

This prompt is important in empowering interviewees to see themselves as agents of positive change. Engaging with the reality of climate change can be overpowering and can leave participants feeling hopeless and without agency. Researchers have shown that empathy and emotional connection, rather than fear of catastrophe, is essential in fostering sustainable relationships with the biosphere.[33] Other research has demonstrated that fear-based messaging has at best limited success at fostering long-term engagement with the climate crisis.[34] In contrast, encouraging interviewees to place themselves in the role of agents of positive change reinforces their engagement with the climate crisis.

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[31] Roeser, Sabine. "Risk communication, public engagement, and climate change: a role for emotions." *Risk Analysis: An International Journal* 32, no. 6 (2012): 1033-1040.

[32] Leggett, Monica, and Marie Finlay. "Science, story, and image: A new approach to crossing the communication barrier posed by scientific jargon." *Public understanding of science* 10, no. 2 (2001): 157-171.; Kearney, Anne R. "Understanding global change: a cognitive perspective on communicating through stories." *Climatic Change* 27, no. 4 (1994): 419-441.

[33] Brown, Katrina, W. Neil Adger, Patrick Devine-Wright, John M. Anderies, Stewart Barr, Francois Bousquet, Catherine Butler, Louisa Evans, Nadine Marshall, and Tara Quinn. "Empathy, place and identity interactions for sustainability." *Global Environmental Change* 56 (2019): 11-17.

[34] O'Neill, Saffron, and Sophie Nicholson-Cole. "“Fear won't do it” promoting positive engagement with climate change through visual and iconic representations." *Science Communication* 30, no. 3 (2009): 355-379.

2.2 Case studies of methodology

To demonstrate various approaches to interview collecting, interview editing, voice sample selection, music composition, and performance, I will describe three "case studies" of my research-creation methodology, detailing work I carried out in Alaska, Québec, and upstate New York. Subsequently, I will examine the process of preparing and writing the *Climate Voices Suite*, my lecture-recital project at McGill, which is built around climate interview excerpts from interviewees from four different countries. I hope to demonstrate how a diversity of approaches to incorporating climate change narrative into musical works can give rise to compelling music and suggest avenues for further research-creation.

2.2.1 Shishmaref, Alaska: "Footsteps in Snow"

The Iñupiat (western Inuit) village of Shishmaref is located on a narrow barrier island on the coast of the Bering sea in northwest Alaska. In the past, extensive sea ice surrounding Shishmaref protected the village from the impact of severe winter storms. As climate change has accelerated, this protective sea ice has receded. Consequently, winter storms now cause heavy erosion—presently Shishmaref is losing about 10 feet of coastline per year, even with the installation of a series of barriers designed to deflect wave impact.[35] This erosion, coupled with high rates of permafrost melt resulting from higher temperatures, has extensively damaged the infrastructure, housing, and water system of the village. In 2016, the village council voted to relocate the village to a site on the mainland, at an estimated cost of $180 million.[36] At present, these funds have yet to be obtained.

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[35] Kolbert, Elizabeth. *Field notes from a catastrophe: Man, nature, and climate change*. Bloomsbury Publishing USA, 2015.

[36] Mele, Christopher and Daniel Victor. "Reeling From Effects of Climate Change, Alaskan Village Votes to Relocate." New York Times, August 19, 2016. https://www.nytimes.com/2016/08/20/us/shishmaref-alaska-elocate-vote-climate-change.html

Figure 4: Aerial view of Shishmaref. Photo by Bering Land Bridge National Preserve.

Figure 5: Erosion in Shishmaref. Photo by Gabriel Bouys/AFP/Getty Images.

I visited Shishmaref in 2015 to lead a climate-interviewing workshop with students from science teacher Ken Stenek's class at Shishmaref High School. During the workshop, the students practiced interviewing and video-recording techniques and discussed how climate change was impacting their community. The students were then tasked with interviewing local elders about their responses to the impacts of climate change on the village. As Shishmaref is a close-knit community, the students mostly interviewed members of their extended family such as aunts, uncles, and grandparents.

The students and I carried out the interviews with the goal of having the elders introduce themselves, describe their connection to their home place, and reflect on the impacts of the changing climate. Among other topics, interviewees spoke about rapid coastal erosion, diminished vegetation, and how sea ice was becoming more unreliable for hunting seal and other prey. The interviewees brought out fascinating details of how climate change is impacting the village. Elder Bessie Sinnok spoke with her nephew Esau Sinnok about how there used to be a wider beach, protected by more vegetation, where she and her friends would play as children:

> *I can remember when we first came here…the beach was probably at least a quarter to a half-mile out from where it is now. We used to be able to run around on the beach in large groups and play different games. Before the beach was a lot of solid ground, a lot of grass…not so much sand. The grass was found all over the island, it grew tall and thick. There wasn't much sand blowing around like there is now.*[37]

Elder Stanley Tocktoo spoke with his nephew Sam Tocktoo about how sea ice had become unstable and how marine mammal populations were suffering:

[37] Sinnok, Bessie. Interview by Esau Sinnok. September, 2015. http://www.climatestoriesproject.org/education.html

> *Nowadays, it's real spooky for us to go out on the ice…it's not solid anymore like the floor or the table. What happens now is that…it flexes, that means it's weak. There's no strength. A lot of our sea mammals such as the bearded seal we depend on for the oil and the meat, and the walrus, they got no haul-out…they're having a hard time too…It all comes back to how we're gonna survive.*[38]

I interviewed elder John Sinnok, who spoke eloquently about the impacts of climate change on Shishmaref. Sinnok recounted details of how wind direction and weather patterns have changed in the past several decades. Strikingly, Sinnok also discussed how the sound of people walking on snow has been transformed as the climate has warmed:

> *Back when I was young, we always had north wind, all the time. And we would have blizzards, and cold north winds for a good month. But after that, we would have real nice weather for at least a month or over a month after that, where people could go out and hunt and get ice for drinking water. And it would be like that for a long time…And the snow would get so cold and dry that you could hear people walking outside, you could hear their footsteps outside, because you could hear the crunch real easy on the snow. Nowadays, it doesn't get that hard any more where you can hear people walking past. The snow doesn't get that hard, dry, anymore, like it used to.*[39]

Sinnok's testimony exemplifies the importance of attachment to home place in relating narratives of climate change. While it is unrealistic to expect that city dwellers not reliant on direct use of natural resources will be able to make such fine-grained observations of the effects of the changing climate, I believe that hearing Sinnok's words encourages listeners to connect with the subtle, or not so subtle, impacts of climate change in their home places.

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[38] Tocktoo, Stanley. Interview by Sam Tocktoo. September, 2015. http://www.climatestoriesproject.org/education.html

[39] Sinnok, John. Interview by Jason Davis. September, 2015. http://www.climatestoriesproject.org/alaska-climate-stories.html

Because of Sinnok's evocative language expressing the "sound" of climate change, his interview struck me as uniquely suited to provide material for creating a musical work. Subsequently, using recorded material from his interview, I wrote "Footsteps in Snow" for solo double bass and recorded voice samples.[40] At the time, I was studying the basics of traditional Inuit music, including drum dance songs *(pisiq)* and throat singing *(katajjaq)* via a course in Ethnomusicology and Performance Practice at McGill. With this background, I referenced elements of Inuit music in "Footsteps in Snow," including bowed harmonics to reflect the sung passages of drum dance songs, vertical bowing techniques to approximate the sound of throat singing, and strummed pizzicato to imitate the timbre of the Inuit frame drum *(quilaut)*.[41]

For the piece, I transcribed a drum dance song, "Siipinngua," performed by Inuit singer Celina Kalluk at the 2010 Winter Olympics in Vancouver.[42] As in most *pisiq*, the sung Inuktitut words are separated by melodic passages which employ the syllables "*aya*" or "*aya-ya*":

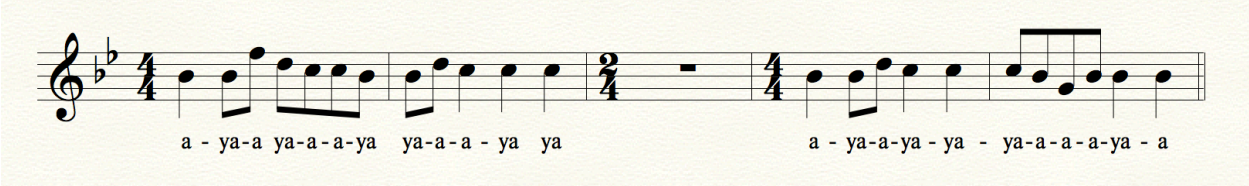

Figure 6: Transcription of melody of "Siipinngua" sung by Celina Kalluk.

I adapted the transcribed melody for performance on double bass, using arco harmonics. This passage shows one technique I used for incorporating Sinnok's voice samples—triggering them at the ends of melodic phrases:[43]

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[40] Davis, Jason. *Footsteps in Snow*. 2017. www.climatemusic.net.

[41] For a thorough discussion of extended double bass techniques such as harmonics, strummed pizzicato, and vertical bowing, see: Turetzky, Bertram. *The contemporary contrabass*. Vol. 1. Univ of California Press, 1974.

[42] Kalluk, Celina. "The People Behind The Inukshuk: Celina Kalluk – Siipinngua." https://www.youtube.com/watch?v=RKRs-Cu2QBA

[43] Voice samples are stored and triggered using the *Go Button* application (for cell phone or tablet) in combination with a Bluetooth AirTurn pedalboard.

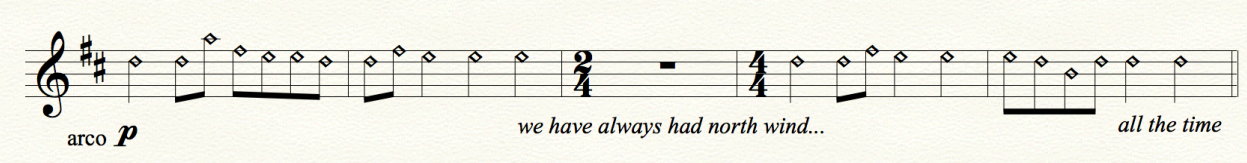

Figure 7: Melodic theme from "Footsteps in Snow," solo double bass with recorded voice samples.

I used strummed pizzicato to imitate the sound of the Inuit frame drum and reference the cadence of footsteps from Sinnok's interview. In this section, Sinnok's voice sample is layered freely over the "footsteps" rhythmic pattern:

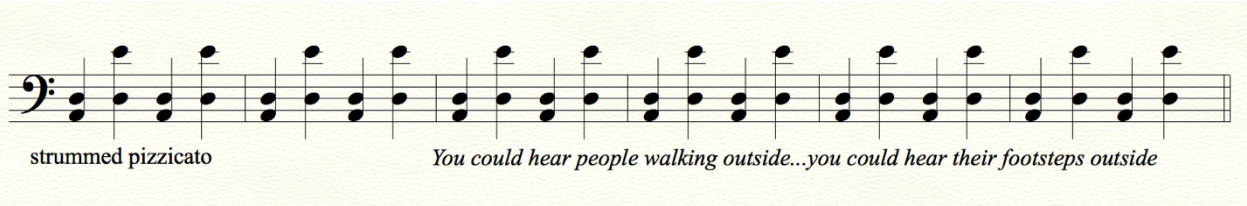

Figure 8: "footsteps" figure, "Footsteps in Snow."

In the piece, I also referenced the sound of Inuit throat singing, a performance technique that is part of a group of musical practices which have been collectively termed "vocal games" or *Katajjaq*. Inuit women have created a large repertoire of these participatory or competitive games for entertainment or to accompany such activities such as juggling or weaving. These vocal games are typically short in length, are built from simple melodic and rhythmic phrases and make extensive use of nasal pitches, vocal overtones, guttural sounds, and sharp intakes of breath.

Ethnomusicologist Jean-Jacques Nattiez recorded and transcribed a large number of *katajjaq,* notating them with square and triangular noteheads to mark guttural sounds and intakes of breath:[44]

[44] Nattiez, Jean-Jacques. "Some aspects of Inuit vocal games." *Ethnomusicology* 27, no. 3 (1983): 457.

Example 2. Complete vocal game in which the second voice imitates the first.

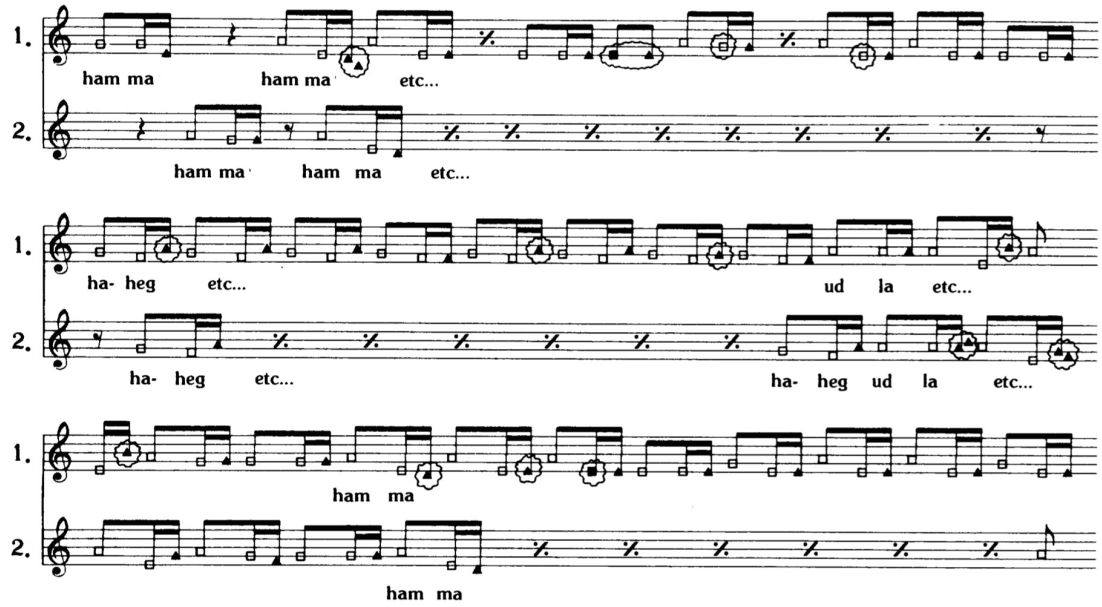

Figure 9: Nattiez, Jean-Jacques. "Some aspects of Inuit vocal games." *Ethnomusicology* 27, no. 3 (1983): 457.

For "Footsteps in Snow," I imitate the sound of throat singing with the use of vertical bowing, a technique in which the bow hair is drawn up and down the strings, from the end of the fingerboard to the bridge of the double bass. The technique gives a guttural, scratchy sound with no clearly defined pitch. I alternate sections of vertical bowing with phrases with standard bowing, in a 6/8 rhythm:

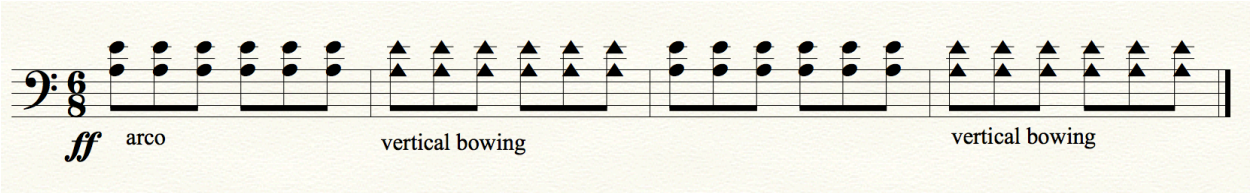

Figure 10: Vertical bowing to imitate throat singing, "Footsteps in Snow."

For my research-creation practice, "Footsteps in Snow" is a starting point for the integration of climate change narrative into music which is inspired by elements from the speaker's culture. This

approach could be considered a type of narrative and musical soundscape of the "personal geography" of climate change, and I seek to continue exploring this path in the future.

2.2.2 Singing climate narratives: "Ice Is What I Remember"

In October 2017, I interviewed Jay, New York resident Joseph Dumoulin at a youth climate summit in Tupper Lake, New York. Dumoulin spoke eloquently of his reflections of growing up playing ice hockey in backyard ponds, and reflected on how these ponds do not freeze as regularly as they did during his youth.[45] The impact of climate change on pond hockey, and on other outdoor winter sports, has received increasing attention as a vivid symbol of how the changing climate is threatening traditional activities which provide meaning and cultural connection for individuals and communities.[46] Dumoulin's narrative, in which he details how pond hockey was a central part of his childhood, provides a powerful example of weaving climate change into deeply personal responses to home places and life activities.

Inspired by Dumoulin's spoken reflections, I wrote "Ice Is What I Remember," for alto voice and double bass.[47] The piece includes recorded voice samples from Dumoulin's interview, which also provide the "lyrics" for the vocalist, which are not used in the sequence which they were in for the original interview:

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[45] Dumoulin, Joseph, Interviewed by Jason Davis for Climate Stories Project. October 2017. http://www.climatestoriesproject.org/new-york-climate-stories.html

[46] Fairley, Sheranne, Lisa Ruhanen, and Hannah Lovegrove. "On frozen ponds: The impact of climate change on hosting pond hockey tournaments." *Sport Management Review* 18, no. 4 (2015): 618-626.

[47] Davis, Jason. "Ice Is What I Remember." 2018. www.climatemusic.net

Ice is what I remember most about my youth

It's just crystal

It was a way of life I thought would never end

But the ice is like a mirror

I realized that that way of life was gone

I structured the piece around the imagery of solid ice melting and turning to flowing water. The form of the piece consists of three sections, each representing a stage of melting ice, and each introduced with an interlude of a field recording sound: A (ice; ice skating), B (melting ice; water droplets), and C (flowing water). As the piece progresses, the relationship between the voice and the bass changes from homo-rhythmic and strictly parallel ("frozen") to freer counterpoint and cannon ("melting"), to mostly improvised ("flowing water").

	Intro	A	Interlude 1	B	Interlude 2	C	Coda
Sound/Imagery	Ice Skating		Melting Ice		Flowing water		
Musical Material		homorhythmic/ parallel	Free improv to sound	Phrasing as "water drops"; looser phrasing between voice and bass	Free improv to sound	Flowing bassline; vocal free improv	Return to material from A

Figure 11: Form of "Ice Is What I Remember"

For both the voice and bass parts, I used melodic material from Erik Satie's "Vexations," a short piece for solo piano which Satie intended to be repeated 840 times in performance, a requirement which to me suggested a "frozen" form. I transposed Satie's theme to match the alto vocal range, and harmonized the double bass with the voice in major ninths:

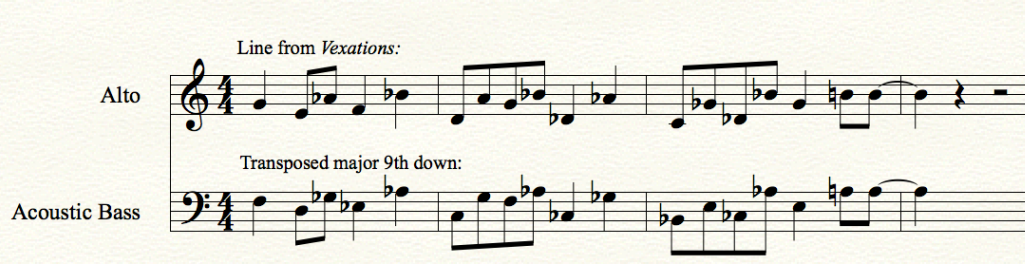

Figure 12: Theme for "Ice Is What I Remember," adapted from Erik Satie's "Vexations."

I used samples of Dumoulin's voice sparingly, mostly to punctuate the ends of musical phrases. In the following section, Dumoulin's phrase "it was just a way of life I thought would never end" follows the voice and bass phrase:

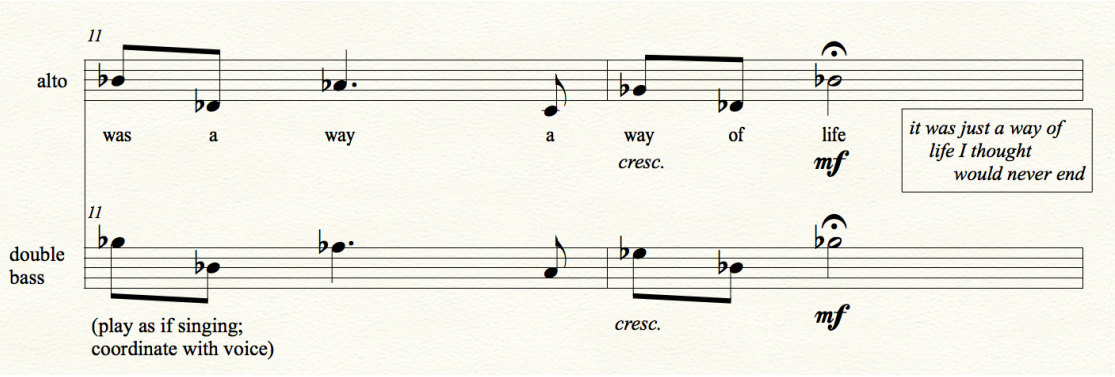

Figure 13: "Ice Is What I Remember," measures 11-12.

Much of "Ice is What I Remember" employs standard notation. However, several sections of the piece make use of "text notation." This notation does not specify pitches or rhythms; instead the performers are presented with text of varied sizes and fonts placed directly on the staff:

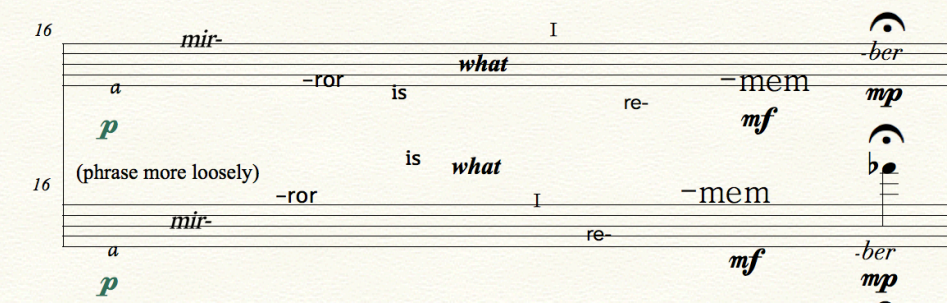

Figure 14: "Ice Is What I Remember," text notation, measure 16.

Passages with text notation in "Ice is What I Remember" can be interpreted by the singer as spoken, sung, whispered, or half-sung, among other techniques. The bassist is also presented with the same text, which either lines up with or is displaced from the text in the voice part. The bassist should play these passages as if they were sung or spoken, with free interpretation of pitch and articulation.

I plan to continue to create pieces which integrate spoken and sung climate narratives, recorded voice samples, composition, and improvisation. There is a great deal of potential for employing sung climate change narrative to deepen the emotional impact of these pieces and to increase the engagement of listeners. Additionally, interpretations by singers could be effectively combined with spoken live narration, a technique being developed in the field of oral history performance.[48]

2.2.3 Soundscape composition: "Mingan Stories/Le Pêcheur Acadien"

I have also been inspired by "soundscape composers," such as David Dunn and Hildegard Westerkamp, who compose music which makes connections between ecological health and environmental sound. Westerkamp says of soundscape composition: "its essence is the artistic, sonic transmission of meanings about place, time, environment and listening perception."[49] An aspect of my own work is depicting soundscapes as modified by climate change, and I have found that soundscape composition, integrated with recorded narratives of climate change, presents many avenues for illustrating climate change through sound.

One of these "climate change soundscape" compositions came out of my doctoral studies at McGill. In spring 2017 I visited Mingan Archipelago National Park Reserve on the Côte-Nord (north coast) of the St. Lawrence Seaway. The park is well-known for an abundance of eroded sedimentary rock "monoliths."

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[48] For an overview of varied approaches to oral history performance, see: Pollock, Della, ed. *Remembering: Oral history performance*. Palgrave Macmillan, 2005.

[49] Westerkamp, Hildegard. "Linking soundscape composition and acoustic ecology." *Organised Sound* 7, no. 1 (2002): 51-56.

Figure 16: Mingan Archipelago National Park Reserve, Québec. Photo by Jason Davis.

The visit was organized with students and teachers from McGill University, Concordia University, Université du Québec à Montréal (UQAM) and Université de Montréal (UdeM) as part of the LandMarks2017 project, an artistic investigation of Canadian parks and protected areas in response to the 150th anniversary of Canada as a confederation. During the visit, I recorded sounds from the park, including running water, Hermit thrush song, rocks which I played as musical instruments, and wind through spruces and other trees. I also recorded an interview with park ranger Guy Côté, who described his childhood fishing, hunting, and collecting plants, as well as the local impacts of climate change, including severe storms and early blooming of local wildflowers. Côté also discussed seasonal harvesting cycles and the stewardship ethics of older generations, who emphasize knowing the rhythms of the land and sea and not taking more resources than are needed:

> *We were conscious then that mother nature had a way to give, but you have to take care about what we got from nature. If we were going to the islands, it was not only for fun. There was a time to pick raspberries, there was a right time to pick bakeapples,*[50] *there was a right time to*

[50] Bakeapples, also known as cloudberries, are boreal plants often used to make jam.

> *pick blueberries, there was a right time to hunt moose. Well, there was a right time to do this, this, and that, but there was not a time to too much get from nature.*[51]

Following the interview, I recorded Côté singing some Acadian maritime songs, including "Le Pêcheur Acadien," a traditional ode to the sea. Upon returning to Montreal, I wrote and recorded "Mingan Stories/Le Pêcheur Acadien," a soundscape composition incorporating fragments of the spoken interview, singing, and environmental sounds to create an audio portrait of climate change in the Mingan archipelago.[52]

Westerkamp also remarks, "No matter what the composer's intent may have been from the start, the materials inevitably speak with their own language, whose deeper meanings may only emerge with repeated listening and sound processing. And that in itself has the power to shift the composer's intent."[53] I am inspired by this recognition that the incorporation of sound sources not of the composer's making can inform musical creation, and I am carrying this approach forward into "site-specific" works, in which the sounds and voices of a place influence and inspire composition.

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[51] Côté, Guy. Interview by Jason Davis for Climate Stories Project. May, 2017. http://www.climatestoriesproject.org/quebec-climate-stories.html

[52] Davis, Jason. "Mingan Stories/Le Pêcheur Acadien." 2018. www.climatemusic.net.

[53] Westerkamp, 2002.

Chapter 3: The Climate Voices Suite

For my doctoral lecture-recital at McGill, I composed and performed the *Climate Voices Suite*, a 20-minute piece for solo double bass and recorded voice samples.[54] In this section of the paper, I will detail my approach to composing the piece, emphasizing how I integrated thematic elements of the interview structure and "set" recorded voice samples to music, specifically referencing methods for setting the samples for solo double bass. My goal is to demonstrate a range of approaches to this format, offering ideas for future developments in the integration of climate narrative and music.

For the piece, I featured voice samples from climate interviews I conducted with people from a wide range of countries, geographic regions, and professions. The following list shows the interviewees, in order of first appearance in the piece. The edited versions of their interviews can be accessed via the links found in the footnotes:

Laura Gill; Stanford, California, USA; environmental educator.[55]

Drew Lanham; Seneca, South Carolina, USA; writer and university professor.[56]

Goksen Sahin; Istanbul, Turkey; climate activist.[57]

Clifford Paul; Membertou, Cape Breton, Canada; Mi'kmaq wildlife manager and hunter.[58]

Rosalie Zerrudo; Iloilo City, Philippines; artist.[59]

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[54] Sections of a recorded version of the *Climate Voices Suite* will be made available at www.climatemusic.net

[55] Gill, Laura. Interview by Jason Davis for Climate Stories Project.
http://www.climatestoriesproject.org/california-climate-stories.html

[56] Lanham, Drew. Interview by Jason Davis for Climate Stories Project.
http://www.climatestoriesproject.org/climate-stories-page1.html

[57] Sahin, Goksen. Interview by Jason Davis for Climate Stories Project.
http://www.climatestoriesproject.org/climate-stories-page2.html

[58] Paul, Clifford. Interview by Jason Davis for Climate Stories Project.
http://www.climatestoriesproject.org/cape-breton-climate-stories.html

[59] Zerrudo, Rosalie. Interview by Jason Davis for Climate Stories Project.
http://www.climatestoriesproject.org/climate-stories-page1.html

Interviews were conducted in person, via Skype, or over the telephone. During the interview, each interviewee responded to prompts from the semi-structured interview format from Climate Stories Project:

1) Who are you and where do you live? What features of your local environment are meaningful to you?
2) What changes in your local environment have you observed that may be due to climate change?
3) How are you responding to climate change in a way that presents a positive way forward?

From an average of a length of 15 minutes, recorded interviews were edited down to 2-4-minutes and shared on the Climate Stories Project website. From these edited interviews, I chose voice samples based on the narrative flow of the piece, which is dictated by the interview themes (see form section below). I also chose voice samples with compelling imagery, cadence, and melody, examples of which will be described in the section on voice sample setting.

The samples were mostly unprocessed to maintain semantic meaning, and several voice samples are repeated during the piece to aid listeners in understanding the spoken phrases. For others, I used time stretching to slow down speech cadence and make the samples more intelligible. However, intelligibility remains a challenge for this and other pieces which use recorded voice samples. Sound quality of the samples varied greatly—interviews conducted live were, unsurprisingly, of much higher quality than interviews conducted via telephone. When needed, I composed lighter textures and performed the bass part quietly so that poor-quality samples were not obscured by musical material. I also provide a written transcript of the voice samples for audience members to read along during the performance, which aids intelligibility. For future works I would

like to work with a sound engineer during the interview recording process to assure higher sound quality and greater intelligibility for the samples.

3.1 Form and musical material

The *Climate Stories Suite* is pre-composed but partially improvised. The large-scale structure, voice sample entrances, and thematic material are worked out in advance, but sections and phrases may be extended, shortened, or altered during performance. I do not use a score and did not memorize the piece as one would for a written composition, and the piece may be quite different from performance to performance. The notated excerpts shown in this paper are included to aid in explaining techniques for setting the voice samples.

The piece is built around three thematic sections based on the interview prompts given above. In section one, speakers introduce themselves and describe their connection to their home places. In section two, speakers describe and respond to the effects of climate change in their home place. In section three, speakers share their thoughts and their feelings about climate change and reflect on a positive way forward through the climate crisis.

Section of piece	1	2	3
Interview Questions/Themes	Introduce yourself. Describe a part of your local environment that has special meaning for you.	Describe changes in your local environment which may be due to climate change.	Describe how you're responding to climate change in a way that represents a positive way forward.

Figure 17: *Climate Voices Suite* thematic form and interview prompts

The following is a transcript of all voice samples in the piece:

Section one (introductions and describing attachment to place):

(Laura Gill)

My name is Laura Gill…I am originally from Stanford, California…and I grew up in the Bay Area.

(Drew Lanham)

My name is Drew Lanham…I live in Seneca, South Carolina…It's a land of change…and really abrupt change.

(Goksen Sahin)

My name is Goksen Sahin…I'm from Turkey…In my hometown…my grandparents…are farmers.

(Clifford Paul)

My name is Clifford Paul…I'm from the Mi'kmaq district of Unama'ki…which is one of seven traditional districts…of the Mi'kmaq nation.

(Rosalie Zerrudo)

I am Rosalie Zerrudo…Living the Philippines and different islands…has given me a lot of awareness of environment…I love the changing colors of the sky…the different colors of the sea…and I love water so much.

Section two (observations of change):

(Laura Gill)

It used to be very predictable…the climate and the weather in Stanford…We would always predict that the day after Halloween would be the first rain…and over the years we don't see that normal cycle any more…I can see those changes very clearly every time I go and visit home.

(Drew Lanham)

What strikes me about the place that I live it's on the edge…on the edge of things…So when I think about climate change I think about it pushing things closer to the edge.

(Goksen Sahin)

A couple of years ago we start feeling…increasing impacts of climate change…I went to my hometown and discussed with the other farmers…They told me it has been 9 months …that it didn't rain.

(Clifford Paul)

We've seen and witnessed and survived dramatic changes in the climate…I look at change…constant flux and motion…How we have evolved with that constant flux and motion…how the earth has evolved over that constant flux and motion.

(Rosalie Zerrudo)

We know that there is climate change…and I think we can really feel it in our daily lives now…One of the things that really I notice…is the weather has really been very very unpredictable…and it has been very difficult for us to even prepare…In an hour rain, part of the city is flooded…so the first people are going to be affected if there's going to be the rise in sea level is going to be us.

Section three (emotional responses and seeking a positive way forward):

(Laura Gill)

Because of what I know sometimes it can feel a little overwhelming.

(Drew Lanham)

There are these millions of other beings that we share the earth with.

(Goksen Sahin)

We have the wisdom of the ancient traditions.

(Clifford Paul)

What we do to accelerate climate change, we also have to accelerate our thinking.

(Rosalie Zerrudo)

Being able to think that we are one, that we are conscious, that whatever we do affects the whole world.

3.2 Melodic theme

To unify the form, a melodic theme is played on the bass with different textures and dynamics to mark each of the three sections. The theme is played quietly at the beginning of the piece, before the first voice entrance, mostly using pizzicato natural harmonics:

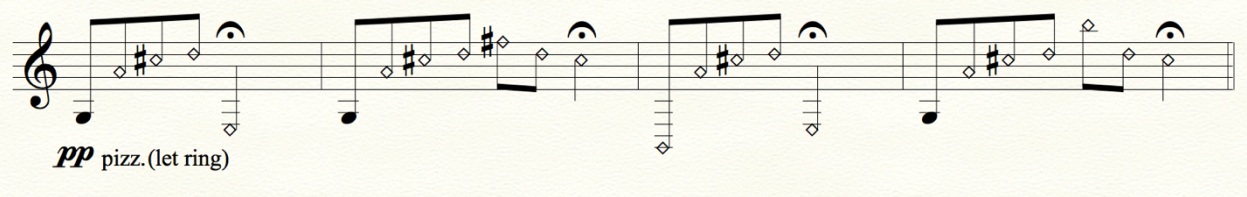

Figure 18: *Climate Voices Suite* melodic theme, section 1.

Between the 1st and 2nd sections, the melody is played using standard (non-harmonic) pizzicato, with ad-lib interjections on each fermata, reflecting the musical material of each interviewee (the musical material will be described in the following section).

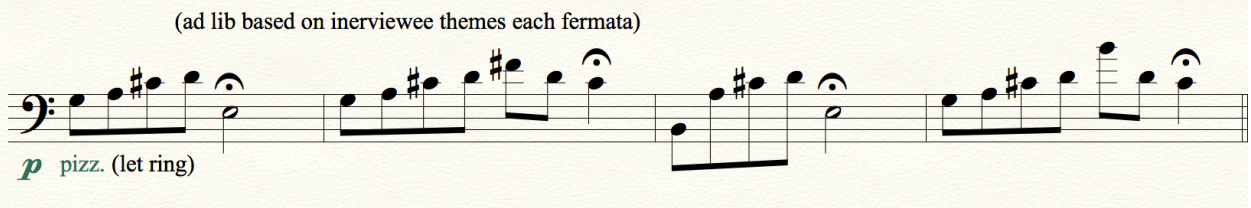

Figure 19: *Climate Voices Suite* melodic theme, section 2.

At the end of the piece, the theme is played fortissimo, *arco sul ponticello*, also with the musical material interjections:

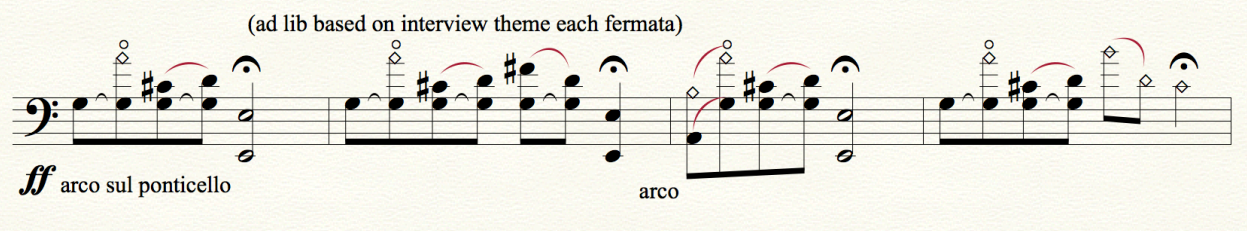

Figure 20: *Climate Voices Suite* melodic theme, section 3.

3.3 Voice sample setting and interviewee musical themes

For the *Climate Voices Suite*, I used a variety of techniques to "set" the voice samples to the composed and improvised double bass part. As part of my preparations for writing the piece, I researched the work of other composers who have utilized recorded voice samples in their music, and I will describe some of these works in the discussion of each setting technique.[60]

Each instance of an interviewee's voice sample entrance is loosely tied to "their" musical material. The connection between speaker and corresponding musical material is not exact; rather each instance of a speaker's voice entrance is accompanied by variations on musical material that complements the cadence and phrasing of their speech. In the following sections, I describe each voice sample setting approach and corresponding musical material used in the *Climate Voices Suite*.

This chart summarizes the bass techniques (arco/pizzicato), musical material, and voice setting technique for each interviewee:

Interviewee	**Bass technique**	**Musical material**	**Voice sample setting technique**
Laura Gill	Arco and pizzicato	double-stop arco harmonics; modal pizzicato vamp	Rhythmic vamp/repetitive background
Drew Lanham	Arco	G minor tonality, double-stops and harmonics	Rhythmic vamp /repetitive background
Goksen Sahin	Pizzicato	pedal point A or E alternating with speech melody and higher-register phrases	Speech melody
Clifford Paul	Pizzicato	free improvised atonal	Gestural accompaniment
Rosalie Zerrudo	Arco	"flowing" harmonics, B minor and E minor	Rhythmic vamp/repetitive background

Figure 21: *Climate Voices Suite* interviewee bass technique, musical material, and voice setting technique

[60] For a survey of works which use recorded voice samples in a variety of compositional approaches, see Lane, Cathy. "Voices from the Past: compositional approaches to using recorded speech." *Organised Sound* 11, no. 1 (2006): 3-11.

3.3.1 Speech melody

Speech melody is a common approach for incorporating recorded speech samples into music. In the simplest form of the technique, a composer or improviser transcribes voice excerpts to determine the pitches, rhythm, and inflections of the spoken words. They then write or improvise musical parts to match the voice samples, layering a musical line onto the recorded speech so the speaker sounds as if they are "singing" their words. Many composers and musicians add layers of harmony or embed the speech in developed musical material. To prepare for live performance, performers must carefully practice the execution of the speech melody parts to accurately match their parts to the timing and phrasing of the voice samples.

Perhaps the best-known example of this approach is Steve Reich's 1989 string quartet piece *Different Trains*.[61] The piece is built around recorded speech excerpts from two groups of interviewees. The first movement of the piece features excerpts from interview recordings of Reich's governess and a train porter speaking about their experience working and traveling on New York-Los Angeles trains in the 1930s and 1940s. In the second and third movements, Reich incorporates speech fragments from archive recordings of Holocaust survivors recounting their experiences during World War II, framed by the imagery and sound of "different trains." In Reich's piece, fragments of music, written by transcribing the speech excerpts, are first played by instrumentalists and then the speech fragments are layered on top of the instrumental parts. For performances of the piece, the musicians play their parts along to pre-recorded strings, which have been synchronized with the recorded voice fragments.

In the *Climate Voices Suite*, I utilize speech melody for the voice samples from climate activist Goksen Sahin of Istanbul, Turkey. I was inspired by Sahin's highly melodic vocal content and

[61] Reich, Steve and Kronos Quartet. *Different Trains/Electric Counterpoint.* Elektra Nonesuch, 1989.

evocative imagery about the struggles of farmers in her region of Turkey to adapt to the severe droughts made worse by climate change. The following are the excerpts from her interview used in the first part of the piece:

My name is Goksen Sahin…I'm from Turkey…

In my hometown…my grandparents…are farmers.

The setting of Sahin's voice samples came about by experimenting with playing an open A pedal on the bass and playing higher passages along with Sahin's voice as speech melody. In the first section of the piece I use short, fragmented phrases from Sahin's interview to emphasize the precision of the speech melody approach and to contrast this approach with other sections which use longer, flowing sections of speech. Following an open section with an A pedal and bass interjections, I trigger Sahin's opening phrase "My name is," which I transcribed as a C-C#-C figure:

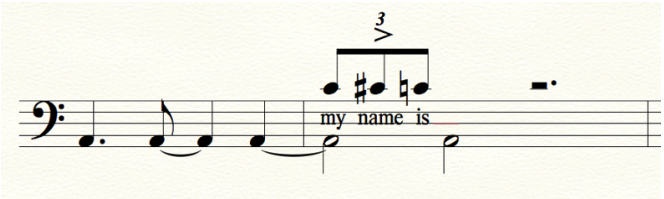

Figure 22: *Climate Voices Suite* speech melody for Goksen Sahin, "my name is"

I sometimes play the speech melody without the voice sample to establish the melodic contour, then repeat the phrase with the voice sample:

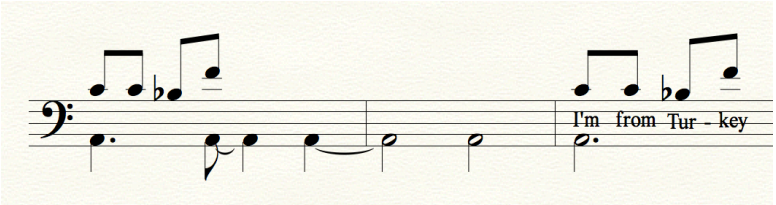

Figure 23: *Climate Voices Suite* speech melody for Goksen Sahin, "I'm from Turkey"

In the second section of the piece, in which interviewees discuss their observations of climate change and their responses to it, Sahin describes the impact of severe drought on her hometown and in other farming communities in Turkey:

> *A couple of years ago we start feeling…increasing impacts of climate change…*
>
> *I went to my hometown and discussed with the other farmers…*
>
> *They told me it has been nine months…that it didn't rain.*

I also use the pedal point approach in this section, except I use an E pedal instead of an A pedal. This section contains longer phrases, reflecting an increase in the range of the melodic and emotional content of Sahin's speech:

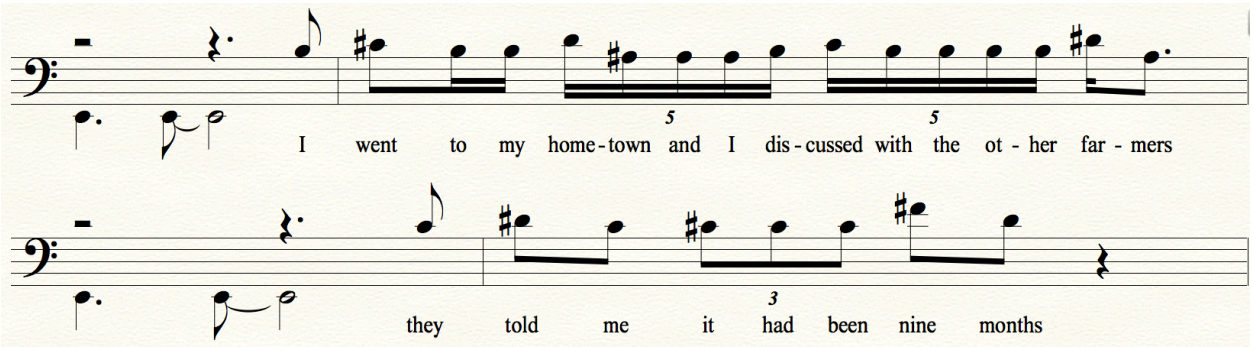

Figure 24: *Climate Voices Suite* speech melody for Goksen Sahin, "I went to my hometown…"

In other sections of the piece I experimented with different methods of using speech melody. For example, I set voice samples from Cape Breton Mi'kmaq hunter and resource manager Clifford Paul in a loose form of speech melody, which I call "gestural accompaniment." Although gestural accompaniment is similar to a standard speech melody approach, it is more improvisational, and is not linked to an exact transcription of the pitches or cadence of the spoken material. Instead, I respond to the general contour of the speech sections with an improvised line, as in the following example from the second section of the *Climate Voices Suite*:

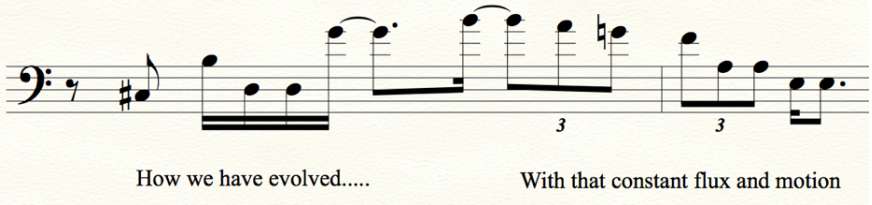

Figure 25: *Climate Voices Suite* gestural accompaniment for Clifford Paul: "How we have evolved…"

I decided to limit the use of speech melody in the *Climate Voices Suite* to these two speakers. Used judiciously, speech melody is an effective and engaging method for setting voice samples. However, I believe that by overusing speech melody one runs the risk of detracting from the expressive and semantic content of the voices. It is impossible to exactly match the pitch, dynamics, inflection, and cadence of human speech on a musical instrument, so any speech melody setting may take away from these vocal nuances.

3.3.2 Repetitive background/vamp

Another common approach to setting voice samples is layering the samples over a composed or improvised musical background, often a repetitive pattern or vamp. An example of this approach is Hermeto Pascoal's piece "Crianças (Cuida de Lá)," in which the composer is heard asking a group of children their names and if they "want to make music now" (vai fazer um som agora?) over a varied background of flutes, keyboard, and percussion.[62] Another example is the piece "Help me Somebody," from Brian Eno and David Byrne's record *My Life in the Bush of Ghosts*, which features voice samples from a sermon by Reverend Paul Morton of New Orleans layered over a repetitive African-inspired groove.[63]

[62] Pascoal, Hermeto. "Crianças (Cuida de Lá)." *Brasil Universo*. Som da Gente, 1986.
[63] Eno, Brian and David Byrne. "Help Me Somebody." *My Life in the Bush of Ghosts*. Sire/Warner Brothers, 1981.

For the *Climate Voices Suite*, I take a similar approach to set the voice samples of several interviewees. In 2018, I interviewed artist Rosalie Zerrudo of Iloilo City, Philippines via Skype. The following is the excerpts from her interview which were used in the first section of the piece:

I am Rosalie Zerrudo…

Living the Philippines and different islands has given me a lot of awareness of environment…

I love the changing colors of the sky…

the different colors of the sea…

and I love water so much.

From Zerrudo's imagery describing water in her home region, I improvised a repetitive "flowing water" pattern on the bass using open strings and arco harmonics. I later transformed a variation on this improvised pattern into the passage used in the piece, in a B minor modal tonality:

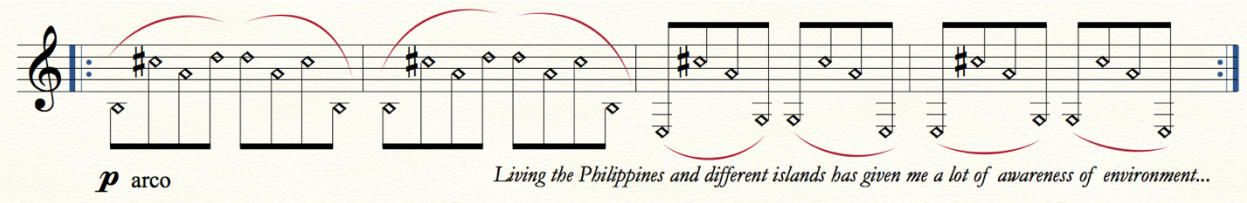

Figure 26: *Climate Voices Suite* "water" accompaniment for Rosalie Zerrudo: "Living in the Philippines…"

Unlike in the speech melody sections, I trigger Zerrudo's samples in a relatively free manner while I play the bass part as a steady pattern, so her words land on different parts of the bass pattern each time the piece is played. My goal is that the "loose" triggering of the voice samples combined with the steady bass pattern reinforces the imagery of flowing water.

Another example of this approach is the setting of the voice of author and university professor Drew Lanham. In the first section of the piece, Lanham speaks about his attachment to his home place in South Carolina and how it is changing rapidly with the changing climate:

I live in Seneca, South Carolina…

It's a land of change…

and really abrupt change.

I set Lanham's voice to a double stop arco figure in a G minor modal tonality:

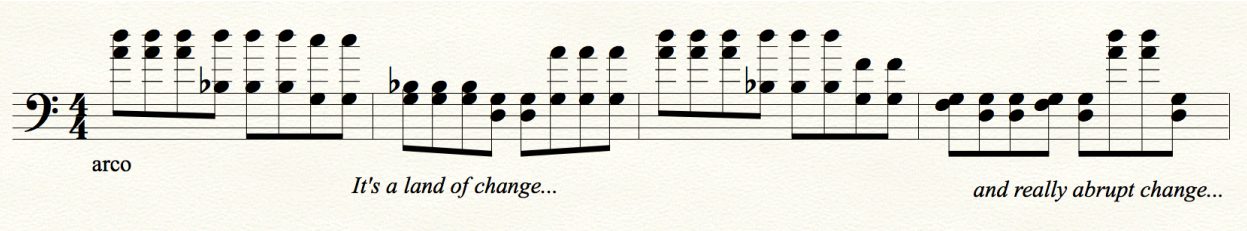

Figure 27: *Climate Voices Suite* accompaniment for Drew Lanham: "It's a land of change…"

As in the section containing Rosalie Zerrudo's samples, I trigger Lanham's samples relatively freely against a steady bass figure. In the second section of the piece, Lanham discusses how climate change is pushing things "closer to the edge" in his home region:

What strikes me about the place that I live it's on the edge…

on the edge of things…

So when I think about climate change I think about it pushing things closer to the edge.

In this section I also set Lanham's voice to a G minor tonality, but with a more legato phrasing in the bass part:

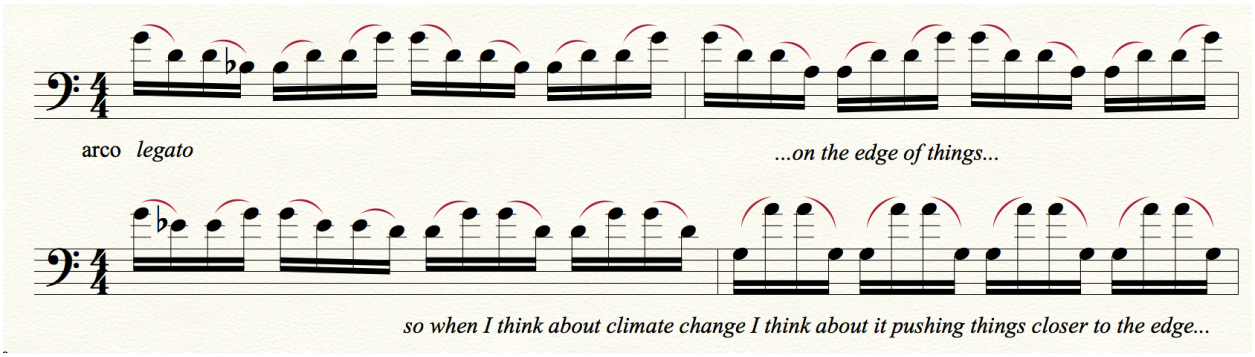

Figure 28: *Climate Voices Suite* accompaniment for Drew Lanham: "on the edge of things…"

A related approach to setting voice samples is isolating the rhythmic cadence of a voice sample and creating a musical groove inspired by this cadence. In the second section of the piece, environmental educator Laura Gill speaks about how the weather in her hometown of Stanford, California has grown more unpredictable:

> *It used to be very predictable…*
>
> *the climate and the weather in Stanford…*
>
> *We would always predict that the day after Halloween would be the first rain…*
>
> *and over the years we don't see that normal cycle anymore…*
>
> *I can see those changes very clearly every time I go and visit home.*

I picked up on loose 12/8 feel in the cadence of Gill's voice, so I set her voice samples to a 12/8 vamp that alternates between D minor and G minor:

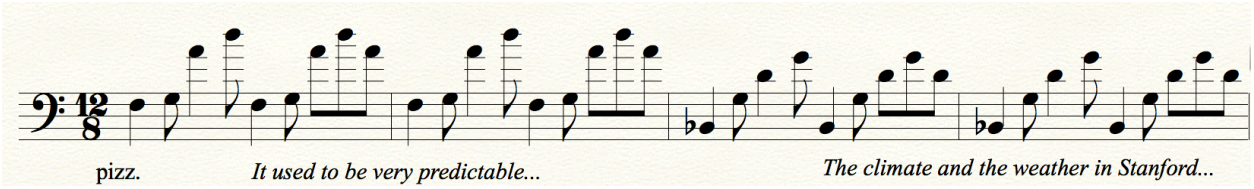

Figure 29: *Climate Voices Suite* accompaniment for Laura Gill: "It used to be very predictable…"

Extracting a rhythmic groove from a voice sample is an approach I plan to explore more in the future. A similar approach is the extraction of a melodic cell from a spoken phrase which could be used to construct and inspire larger sections of music. Both these cases could be considered a "halfway point" between the controlled speech melody approach and the free layering of voice samples over a musical background.

It is important to note that these setting approaches are not compositionally fixed—in performance I may choose to, for example, play a faster variation of the background figure under Drew Lanham's "on the edge of things" section. Or I may choose to alter the "water" pattern used for Rosalie Zerrudo's sections to include other notes or move out of the B minor tonality. I feel that this flexibility lends an organic quality to the piece which would be lost if it was fully through-composed.

The use of speech melody and other musical techniques for setting speech samples also raises interesting questions about the intersection between speech and musical phrasing. While this topic remains beyond the scope of this paper, it does present avenues for future research, particularly an investigation of how variations in the melodic and rhythmic content of speech influences the construction of setting techniques and their impact upon listeners.

Chapter 4: Conclusions/discussion/future directions:

4.1 Ethics

I was conscious of the need to maintain high ethical standards throughout the project. Despite fully disclosing to interviewees the ways in which their interview would be used and obtaining formal ethics approval from the McGill Research Ethics Board, there remain deeper questions about using full interviews to craft condensed narratives and as material for musical compositions: Do I do interviewees a disservice by creating and sharing an edited and condensed version of their interview? Can this condensed version be considered "their own words"? Am I "using" the interviewee to forward my own narrative of climate change and its impact on people and communities? Is it disrespectful to turn spoken words into speech melody or other musical treatments?

I have sent recordings of the condensed interviews and the music pieces to all interviewees, and requested feedback about their responses to the material and to hearing their voice in these formats. I have received mostly non-specific feedback, which was generally positive about the condensed narratives and the music pieces. In one case, an interviewee gave constructive feedback about the first version of her edited narrative, which was incorporated into a second version. As of yet, I have been unsuccessful in obtaining more detailed feedback from interviewees about their responses to the recorded music pieces, such as specific responses which would allow me to conclude that interviewees felt that my use of their voice in music composition was inappropriate or disrespectful. Going forward, I plan to develop a written survey in which interviewees would be prompted to give detailed feedback to specific questions about their responses to the music pieces.

4.2 Climate narrative music as social engagement

Is it possible to draw conclusions about the effectiveness of climate narrative music on increasing engagement with climate change? While I don't believe that writing and performing this music represents an "intervention" for increasing climate change engagement, it may provide a template for studying how listening to and sharing climate stories could increase public understanding of and engagement with the changing climate.

I envision carrying out a series of experiments which would test the impact on engagement of listening to recorded climate change stories in different formats. As an example, participants would first be evaluated for their understanding of and engagement with climate change, using a written survey.[64] After listening to a recorded climate narrative without musical setting or with different musical settings, the listener would be re-evaluated for their understanding and engagement. This type of experiment could also be carried out to compare the impact of, for example, listening to a radio news segment about the projected future impacts of sea level rise and higher global temperatures with the impact of listening to recorded first-person climate stories about the impacts of sea level rise on local communities. Results from these studies could bolster the case for communicating climate change through narrative and artistic formats, helping widen and deepen the reach of climate messaging.

4.3 Community climate narratives and artistic creation

One avenue for future research-creation could be collaborative place-based soundscape composition which incorporates recorded climate change narratives. Students or other residents in

[64] The following source provides a good example of a survey for measuring climate change engagement: Lorenzoni, Irene, Sophie Nicholson-Cole, and Lorraine Whitmarsh. "Barriers perceived to engaging with climate change among the UK public and their policy implications." *Global environmental change* 17, no. 3-4 (2007): 445-459.

different geographic regions and communities could be invited to record and share climate stories as well as sounds of the local environment. Collaborating composers, musicians, and sound artists could integrate this material into soundscape compositions tied to specific home places. An analogous approach for the visual arts is the Photovoice project, for which participating residents are tasked with taking and sharing photographs to increase engagement with social or environmental issues.[65]

Another model could be soundscape artist Leah Barclay's "Sonic Ecologies," a "site-specific electroacoustic music project embedded in a multi-layered community-cultural engagement process developed in response to the community under study at a particular time."[66] Under the Sonic Ecologies framework, composers work within communities to carry out sound walks of the local environment, create maps of natural sound, compose electro-acoustic pieces in collaboration with local artists, and provide tools for community members to continue building on the sound-engagement process instigated by the visiting artist. I envision the current project growing in this direction—creating and disseminating community-based musical works created from or inspired by local climate narratives.

Moving forward, I plan to broaden the selection of interviewees for the project. I would like to create music featuring stories from people such as migrants displaced by climate change-induced droughts, urban residents impacted by asthma made worse by global warming, and young people inspired to get involved with climate activism. My goal is that as the project becomes more well-known, people from around the world will submit stories which reflect a wide diversity of human

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[65] For an example of how Photovoice is used in community responses to climate change, see: Baldwin, Claudia, and Lisa Chandler. "'At the water's edge': community voices on climate change." *Local Environment* 15, no. 7 (2010): 637-649.

[66] Barclay, Leah. "Sonic ecologies: Exploring the agency of soundscapes in ecological crisis." *Soundscape: The Journal of Acoustic Ecology* 12, no. 1 (2013): 29-32.

stories about the climate crisis. Ultimately, I hope that this climate narrative music becomes a means for musicians, composers, artists, scientists, and community members to make climate change a part of their own story. I believe that this process encourages clear thinking about the challenges we face, and inspires creativity in forging a positive future.

Appendix A: McGill Research Ethics Board Approval Certificate

McGill

Research Ethics Board Office
James Administration Bldg.
845 Sherbrooke Street West. Rm 325
Montreal, QC H3A 0G4

Tel: (514) 398-6831

Website: www.mcgill.ca/research/researchers/compliance/human/

Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 16-0618

Project Title: Climate Change Narrative Collection for Original Music Composition and Performance

Principal Investigator: Jason Davis

Department: Performance (Music)

Status: Ph.D. Student

Supervisor: Prof. John Hollenbeck

Approval Period: June 8, 2018 – June 7, 2019

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Lynda McNeil
Associate Director, Research Ethics

Appendix B: Participant Informed Consent Form

Researcher: Jason Davis, DMus. Candidate, Performance Studies, Schulich School of Music, McGill University

Supervisor: John Hollenbeck, Associate Professor of Jazz, Dept. of Performance, Schulich School of Music, McGill University.

Title of Project: Climate Change Narrative Collection for Original Music Composition and Performance

Sponsor(s): This project is partially funded by a McGill Department of Music Mobility Grant

This is an invitation to participate in an artistic research and creation project for which I am recording spoken reflections on personal responses to climate change, such as observations of changes in seasonal timing, resource availability, and weather patterns. I choose fragments of the recorded interviews to be incorporated into original music compositions which will be performed live and recorded. I will also describe the interview and artistic creation process in my dissertation and public presentations.

Participation in this project is voluntary. If you agree to participate, we will conduct an audio-recorded interview of about 30-45 minutes for which you will be asked to speak about your responses to the changing climate. You may refuse to answer questions during the interview. You may withdraw from the project at any time before music pieces which contain your interview material are composed (you will be notified before this step begins), which will not result in any loss of benefit to which you are entitled. Unless you withdraw, the interviews will be edited to a length of about 3 minutes and shared on the publically accessible website www.climatestoriesproject.org. If you withdraw from the project, the recorded interviews will be erased and interviews and photos published on the website will be removed. Interview editing for sharing online and use in music pieces is done at my discretion to meet the needs of the project. In music pieces, speech fragments may be layered, processed, or used out of sequence from the original interview.

Unless you choose to remain anonymous, your name, place of residence, and profession may be included in my dissertation and in my public presentations. With your consent, I will take a photograph of you which will be included with your name and place of residence alongside the edited interviews online. Basic personal information is recorded on a paper form which is stored a binder kept in my residence and not accessible to others.

There are no anticipated risks to you by participating in this research. Except for Indigenous Elders (who receive compensation of $100), you will not receive monetary compensation for participation. I hope that you benefit from having your climate change story shared with the public through a creative medium. My desire is that people exposed to this work will gain a deeper connection to the changing climate and the ways in which individuals and communities are responding to it. The results of the project will be returned to your community in the form of digital files of the full interviews, edited interviews, and recorded music pieces. If funding permits, I will return to the community and do a public presentation to share sections of the interviews and music pieces in person.

Questions about the project can be directed to Jason Davis at jasondavis2@mail.mcgill.ca or at 438-503-4054. If you have any ethical concerns or complaints about your participation in this project, and want to speak with someone not on the research team, please contact the Associate Director, Research Ethics at 514-398-6831 or lynda.mcneil@mcgill.ca.

Please sign below if you have read the above information and consent to participate in this study. Agreeing to participate in this study does not waive any of your rights or release the researchers from their responsibilities. A copy of this consent form will be given to you and the researcher will keep a copy.

You consent to have your edited interview shared on the website www.climatestoriesproject.org: Yes_____ No_____

You consent to be identified by name, place of residence, and occupation on the above website: Yes_____ No_____

You consent to have your photo taken and published on the above website: Yes_____ No_____

Participant's Name_____

Participant's Signature_____
Date_____

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