

Composition - Research Paper
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ECOGNOSIS

Ecological Awareness in Multimedia Composition

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Contents

Acknowledgments	2
Abstract	3
Preface	4
Introduction	5
On Ecological Awareness	7
Where We Stand	7
Accessing	10
Ecological & Data Art	12
North Atlantic	16
Losing Using Language	20
<i>Teanga</i> - Tongue	20
<i>Mo Ghaeilge</i> - My Irish	22
<i>feamainn</i> - seaweed	24
Data Is Ephemeral	27
Veering	32
Conclusion	35
Bibliography	37

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Abstract

This paper is concerned with ecological awareness in multimedia composition often with the use of data as a compositional tool. It covers the philosophy of ecological awareness I wish to represent in my work and the aesthetic principles used to portray it. The philosophy is largely based on Timothy Morton's *Dark Ecology* with influence from other writers and artists. The reader will be guided through my methodologies of multimedia composition (acoustic, electronic and visual), in four different works. The motivation behind this research has come from wanting to engage with environmentalism not just through writing and individual actions but through art and how understanding the importance of perception of the environment can change our behaviour to it.

Preface

I am a composer and performer and my music has existed both outside and within academic institutions. Writing music as part of a community of artists as well as a more personal study of composition in academic institutions have both played a significant part in shaping me as an artist. I hope for my work to be intellectually and artistically stimulating for listeners on both sides of the institutional fence, whether they are knowledgeable of contemporary musical languages or not. Art is, with no exception to music, inherently political and I eschew from composing music which resides in pure abstraction. With my interest in environmentalism, it seemed appropriate to engage with it somehow in my work. In the past number of years I have become interested in multimedia music, writing for acoustic instruments with electronics and visuals which are generally live. With my background in mathematics and learning to code I knew I could make multimedia work using data and perhaps comment on the nature of humanity's relationship to data. Studying for a masters in composition has allowed me the time and resources to research the *how* and the *why* of engaging in such a topic artistically.

Climate change is not just a science issue but an everything and everyone issue. From learning that our perception of our environment shapes our behaviour towards it was the initial inspiration to begin this research. What is a suitable ecological awareness to have in our contemporary society? What role can art play in enhancing our ecological awareness?

Introduction

The focus of this paper will be ecological awareness, an awareness of a myriad of spatiotemporal scales in our world and an appreciation of ambiguity, and its representation in art. Throughout, a theoretical and practical framework will be provided. The aforementioned frameworks will inform a portfolio of four multimedia works for acoustic instruments and audio-visual media. In the proceeding chapter, the moment in human and geological history in which we are living will be defined. The definition of this specific moment in time is important in order to understand that our contemporary logic leads to an anthropocentric interaction with our environment.

This paper will then illustrate that science and language are not the only tools for engaging in ecological issues, instead using art as a tool for appreciating ambiguity and the uncanny can change our behavioural interaction with nonhumans. Any object which is not a human-being is included in the definition of nonhuman (e.g., bacteria, plants, ecological systems, inanimate objects , etc.). Much of these ideas are inspired by Timothy Morton's concept *Dark Ecology*, a logic of future coexistence. In fact, the title of this paper is derived from *Dark Ecology*. *Ecognosis* means getting used to something strange and including nonhumans within the human, both biologically, socially and within thought and logic.

By firstly addressing ecological awareness, the foundations can be set for an engagement with the philosophical definitions surrounding *object-oriented ontology* (OOO), a 21st century philosophy about how things cannot be fully accessed. A core idea taken from OOO is the notion of ecological systems as hyperobjects, something massively distributed in time and space which transcends human ways of understanding.

Ecological and data art exist in many forms and an argument for the aesthetic success of certain types will be analysed in a handful of works from multiple artistic disciplines. Particular attention will be given to works that use data as a compositional tool and whether the work is attempting to represent an ecological system or if it questions our interaction with data and the hyperobject it's examining. The paper will proceed by drawing on the philosophy of ecological awareness and these aesthetic principles, informing my works which engage with a hyperobject.

North Atlantic (2021) is a work written for chamber ensemble and sonified and visualised weather data. It portrays the flattening of climatic complexity in data and engages with the hyperobject of the North Atlantic trade winds.

feamainn (2021) is composed for chamber ensemble and fixed audio-visual media which incorporates lexical data of the Irish language. It investigates the hyperobject that is the Irish language, expressing an uncanniness about the language opposed to the more normative, traditional aesthetic it holds. Research will be presented on the importance of the Irish language for ecological awareness in Ireland and a personal motivation for using a minority language in my work.

Data Is Ephemeral (2022) is composed for chamber ensemble and live audio-visuals made from a list of data headlines. The work approaches the hyperobject of humanity and presents data as a small slice of a larger, murky and complex sound world.

Veering (2022) is a work for solo viola and live audio-visuals. The essence of the piece is making the mundane uncanny, that a plethora of spatiotemporal scales exist all around us. These human and nonhuman scales are portrayed in the visuals from video footage taken in my locale. The musical elements serve as a poetic analogy for appreciating such scales that lie beyond our modes of access. It is the only work in this portfolio which does not employ data as a compositional tool.

In the conclusion, I reflect on how this research has informed my practice. Ecological awareness will remain a part of my future work. Multimedia composition has more easily allowed me to approach ecological issues artistically by using a visual element. Because of this, I aim to further my skills in the visual arts and creative coding. Finally, I question the context in which my work exists and hope to bring my practice across more disciplines and different audiences.

On Ecological Awareness

Where We Stand

We are living in the Anthropocene, an age in which humanity is now a planetary geological agent, imprinting a stratospheric layer and causing the sixth mass extinction on earth. The Western concept of Nature as a nonhuman self-correcting harmonious system is not only untrue but is responsible for the crisis.¹ We are slowly beginning to realise that our logic of the world is not suitable. Euclidean geometry, which proposed a universal homogeneous space, has been swallowed by the much more liquid Gaussian spacetime, as put forward by Einstein.² This realisation of the complexity of the world, since the advent of the likes of general relativity, chaos theory and quantum theory, is giving rise to the uncanny feeling that a myriad of temporal and spatial scales coexist on our planet.³ Ecological awareness is an awareness of these scales: human scale; geological scale; climate scale; bacteria scale; DNA scale.

Filmmaker Adam Curtis' latest documentary series poignantly portrays this realisation of something deeper about our environment, "that the idea which dominated science, that the world's climate was a stable self-correcting system, was wrong. That it could suddenly shift into a completely different state, which would have extraordinary consequences."⁴ Ecological awareness therefore is also an awareness of unintended consequences.⁵ There is an unknownness deeply embedded in ecological systems which humans cannot control. The relationship between society and its environment is never monocausal or predetermined.⁶

¹ Timothy Morton, *Dark Ecology: For a Logic of Future Coexistence* (New York, US: Columbia University Press, 2016), 58.

² Albert Einstein, 'Autobiographical Notes,' in *Albert Einstein: Philosopher-Scientist* Paul Arthur Schlipp (ed.) (New York: MJF Books, 2001), 9.

³ Morton, *Dark Ecology*, 10.

⁴ Adam Curtis, 'Part Three - Money Changes Everything' *Can't Get You Out of My Head: An Emotional History of the Modern World* [documentary television series] (UK: BBC, 2021), 00:26:45.

⁵ Timothy Morton, *All Art is Ecological* (UK: Penguin, 2021), 16.

⁶ John Haldon, et al., 'History meets paleoscience: Consilience and collaboration in studying past societal responses to environmental change,' *PNAS* 115/13 (2018): 3210-3218 (3217).

This kind of awareness cannot exist, unfortunately, within our current political-economic system. The default utilitarianism of capitalism cannot allow for solutions to global warming.⁷ Capitalism's growth fetish by its very nature is opposed to any notion of sustainability, let alone climate scientist James Lovelock's idea of sustainable retreat.⁸ This is the idea that it is much too late for sustainable development and that humanity needs to leave behind its desire of infinite progress.⁹ The climate crisis fits as one of psychoanalyst Jacques Lacan's *Real*; a traumatic void that any 'reality' must suppress. "Environmental catastrophe features in late capitalist culture only as a kind of simulacra, its real implication for capitalism too traumatic to be assimilated into the system."¹⁰ Ecological awareness is shaking our belief in the anthropocentric idea that there is one scale to rule them all, the human scale. Geological timescales don't yet fit our public policies and capitalist economics cannot accommodate the very things ecological thought and politics require: nonhumans and unfamiliar timescales.¹¹ There are thousands of simultaneous legitimate spatiotemporal scales that have become available and significant to humans.¹² Our sense of earth is full of places with different scales: house, city, country, tectonic plate, whale migration pathway, wolf territory, and bacterial microbiome.

Philosopher Timothy Morton's *Dark Ecology* is the concept I take up throughout this paper to engage with ecological awareness. "Ecological awareness is dark... insofar as illumination leads to a greater sense of entrapment."¹³ As stated, ecological awareness is an awareness of different scales, scales that disorient normative concepts such as present, life, human, nature and logic.¹⁴ Something that happens on a small scale could have a very different effect on a larger scale. Consider the sorites paradox for global warming: one car ignition doesn't cause it, two doesn't, three doesn't... a billion doesn't?! So there is no

⁷ Morton, *Dark Ecology*, 52.

⁸ Mark Fischer, *Capitalist Realism: Is There No Alternative* (Winchester, UK: Zero Books, 2009), 19.

⁹ James Lovelock, *The Revenge of Gaia: Why the Earth is Fighting Back - and how We Can Still Save Humanity* (UK: Allen Lane, 2006), 7.

¹⁰ Fischer, 18.

¹¹ Eric Posner, David Weisbach, 'Public Policy Over Massive Time Scales,' *The History and Politics of the Anthropocene*, University of Chicago [conference, 17th May 2013].

¹² Morton, *All Art is Ecological*, 32.

¹³ Morton, *Dark Ecology*, 110.

¹⁴ *Ibid.*, 159.

global warming. We can't just draw a line for when such events are caused. Language imprecisely dissects the world into objects and, for most everyday purposes, it serves as an effective tool of communication. Although, for instance with the sorites paradox, our imprecise intuitions run into trouble.¹⁵ Feminist theorist Karen Barad describes the rigid distinctions we make in the world as *cuts*, such as the dichotomies of right-wrong, here-there, dead-alive, human-nonhuman, when things begin and end.¹⁶ A modal, paraconsistent logic is needed. One that can accept *kind of* true and *slightly* false statements.¹⁷ This would allow us to appreciate the ambiguity and the unknownness of ecological systems and disorienting timescales all around us. We need these tools as being in an era of mass extinction is intrinsically uncanny.¹⁸ What better way is there to appreciate ambiguity and uncanniness than with art?

Climate change is not just a science issue, it's an everything and everyone issue.¹⁹ I had confined climate change activism to the intellectual, scientific part of my thoughts and had not considered challenging my perception of the environment through other media. If we are to change our behaviour towards the environment, it must come from a shift in our ideological position. Composer David Dunn posits that this shift can only happen when we use a language that includes the voices of other life: a language as a form of communication, be it science, literature, art, music, etc.²⁰ It appeared then that music could enhance one's ecological awareness. It is no coincidence that artists and musicians begin to interact with the environment at a time of ecological crisis. Historian John Haldon defines the *cultural logic* of society as "how people understand what happens in their world directly determines how they respond and how they transform their environment."²¹ Dark Ecology is a suitable candidate for our cultural logic: a logic of future coexistence.

¹⁵ Seán Bean, *Vagueness and Boundaries: A Practical Approach to the Sorites Paradox* (BA diss, Trinity College, Dublin, 2019), 18.

¹⁶ Karen Barad, Adam Kleinman, 'Intra-actions,' *Mousse* 34 (2012): 76-81 (78).

¹⁷ Morton, *All Art is Ecological*, 25.

¹⁸ Timothy Morton, *Being Ecological* (UK: Pelican Books, 2018), 49.

¹⁹ Margaret Klein Salamon, *Facing The Climate Emergency: How to Transform Yourself with Climate Truth* (Gabriola Island, Canada: New Society Publishers, 2020), 36.

²⁰ David Dunn, *Music, Language and Environment* (self-published, 1984) Available at <http://daviddunn.com/~david/writings/mle.pdf> (accessed 9th January 2021), 9.

²¹ Haldon et al., 3212.

Accessing

Thought, made up of language and science, has been the anthropocentric priority access mode to the world. Logocentrism is the myth that language allows full access to an object, that we can *know*, *understand* or *comprehend* a thing through words alone.²² Philosopher Ludwig Wittgenstein challenges such a hierarchy of access, “If a lion could talk, we could not understand him.”²³ He acknowledges that a mere linguistic code cannot bridge the gap between human culture and the mind of the lion and that the lion has its own form of accessing the world. The assumption that nonhumans cannot access the world, because of an apparent lack of language, has been central to the exploitation of them. Yet accessing does not require language in human terms.²⁴ The realisation that language, with erroneous beliefs and assumptions deeply embedded within it, is the most potent shaper of our perception of the world is every reason to deconstruct logocentrism. We must confront the gap between description and what is being described.²⁵

When experiencing art, in any form, humans enter into an emotional, mysterious and beautiful dialogue with a nonhuman, the artwork itself. The aesthetic dimension allows one to find themselves existing outside the regular logic of reality.²⁶ Art breaks open an *impossible* access to the inaccessible.²⁷ This form of access is the essential key to appreciating ambiguity. It aligns with a narrative of thought highlighted by Morton:

David Hume, the renowned Scottish philosopher of the later 1700s, argues that you just can't peer directly under the lid of data to get at what things actually are. And his immediate successor in the later eighteenth century, the philosopher Immanuel Kant, explained why: it's because of this radical

²² Morton, *Dark Ecology*, 51.

²³ Ludwig Wittgenstein, *Philosophical Investigations* G.E.M Anscombe (trans.) (Oxford, UK: Basil Blackwell, 1986), 225.

²⁴ David Dunn, *Nature, Sound Art and the Sacred* (self-published, 1997) Available at <http://daviddunn.com/~david/writings/terrnova.pdf> (accessed 2nd January 2021), 11.

²⁵ Dunn, *Music, Language, Environment*, 4.

²⁶ Herbert Marcuse, *The Aesthetic Dimension: Toward a Critique of Marxist Aesthetics* Herbert Marcuse, Erica Sherover (trans.) (Basingstoke UK: Macmillan, 1986), 72.

²⁷ Timothy Morton, *Ecology Without Nature: Rethinking Environmental Aesthetics* (Cambridge Massachusetts: Harvard University Press, 2007), 25.

gap... the gap between things and data. Ecological things are very complex, involve a lot of moving parts, are widely distributed across Earth and across time, and so on. So peering under ecological thing-data is obviously impossible—we get confused when we try.²⁸

Rather than totally *knowing, understanding* or *comprehending* the environment, we must accept there is an unknown quality to such complex objects. Speculative realism is a 21st century branch of philosophy which opposes the idea of prioritising human thought. It rejects the anthropocentric correlation between thinking and being—that objects only exist when thought of by humans. Instead of privileging humans as *subjects* and disregarding nonhumans as *objects*, speculative realism allows nonhumans an equal footing of accessing the world independent of human thought. For instance, philosopher Graham Harman states, “the relation of humans to pollen, oxygen, eagles or windmills is no different in kind from the interaction of these objects with each other.”²⁹ Harman formulated a subset of speculative realism called *object-oriented ontology* (OOO). OOO argues that nothing can be grasped, or accessed, all at once in its entirety. OOO holds that objects exist in a withdrawn way, in which “they cannot be splayed open and totally grasped by anything whatsoever, including [the object] themselves.”³⁰ According to OOO, we can access an object not just by thinking about it. We could taste it, sit on it or even write a poem about it, even nonhumans can equally access objects. Indeed music can be written to access an object. As Morton explains, with OOO, “anthropocentrism is impossible, because thought has been extremely closely correlated with being human for so long, and because human beings have mostly been the only ones allowed to access other things in a meaningful way. OOO offers us a marvellous world in which being a badger, nosing past whatever it is that you, a human being, are looking at thoughtfully, is just as validly accessing that thing as you are.”³¹ In a way that differs from the neoliberal scientism

²⁸ Morton, *Being Ecological*, 23.

²⁹ Graham Harman, *Guerrilla Metaphysics: Phenomenology and the Carpentry of Things* (Chicago, Illinois: Open Court, 2008), 1.

³⁰ Morton, *Dark Ecology*, 16.

³¹ Morton, *All Art is Ecological*, 10.

and demystification of the world, OOO believes that reality is mysterious and magical. If an ecological culture and politics depends upon the re-enchantment of the world and appreciation of ambiguity then OOO is highly desirable.³²

It is now known that objects such as ecological systems are highly complex and with the knowledge of OOO we cannot access them entirely. We can access them ephemerally. Morton calls such objects hyperobjects, entities that are massively distributed in space and time in such a way that we can only access slices of them and that they transcend human access modes and scales.³³ A hyperobject could be the climate, humanity, a pandemic, or even all the plastic in the world. Currently neoliberal scientism is obsessed with data, thinking we are making the invisible visible, that we are unearthing the hidden structures in our environment. This is how we are accessing and perceiving these hyperobjects. This form of realism is pervasive in the production of culture and art.³⁴ In particular this can be seen within the now popular use of data in art.

Ecological & Data Art

Through art, we can enter an aesthetic and poetic realm of an object which the artwork is investigating. Art is important in accessing our relationship to nonhumans in an object-oriented ontological sense. It is another equally valid angle of access. Data art, influenced by neoliberal scientism, that tries to mimic an ecological system is perpetuating the falsehood that it represents the totality of a complex system. Dunn posits that ecological art should not be about bringing out latent musical qualities of nature, but rather putting into question our interaction with nonhuman systems.³⁵ The aesthetic experience should not be about data, but about data-ness, “the qualities we experience when we apprehend something.”³⁶ In my work, data is not meant to be didactic or mimic the environment, but to challenge the notion of data as an article of faith and to question the way we access specific hyperobjects. Adorno believed it was the task of art to critique instrumental

³² Morton, *Dark Ecology*, 17.

³³ Morton, *Being Ecological*, 125.

³⁴ Fischer, 16.

³⁵ Dunn, *Music, Language, and Environment*, 7.

³⁶ Morton, *Being Ecological*, 121.

reason, the rational scientific approach to understanding the world.³⁷ This can be seen in the works of Messiaen using the piano to imitate birdsong as a mimetic and aesthetic act. Whereas, in contrast to this, using physical modelling to synthesise birdsong is instrumental rationality. Central to this critique is avoiding the idea of data as absolute.³⁸ This becomes increasingly important in our evermore rationalised world. Below, I provide examples of convincing and not-so-convincing works of ecological and data art, and whether they question our interaction with nonhumans or if they are just an aestheticised transfer of information.

Artist Emery C. Martin created *Databergs* (2014), a series of seven sculptures using disparate and dizzying amounts of data to make forms which resemble icebergs.³⁹ The sources of data include stock indices, transit data, weather data and data about commodities to name a few. Juxtaposed in a way to represent specious correlations, the sculptures show the malleability of information in an age dominated by analytics. The datasets which form the sculptures are telling the story in which human activity will cause the end of its own existence. Martin is questioning the notion of data as an article of faith rather than trying to reveal a hidden structure in the environment. This is what composer Matthew Ostrowski would consider aesthetically successful with its quirky use of data.⁴⁰

Another work which has great aesthetic intervention over data is the multimedia installation *Listening Post* (2001) by Ben Rubin and Mark Hanson. It is a real-time audio-visual work which culls text from across the internet.⁴¹ The text, which consists of personal chat messages, is displayed on hundreds of small LED screens and sonified using text-to-speech. The work portrays the breadth and scale of these datasets. It investigates the hyperobject of humanity and how these digital records of human activity are used to answer societal questions. Rather than the aesthetic experience being about information or data, it's about our relationship to data.

³⁷ Simon Jarvis, *Adorno: A Critical Introduction* (New York, US: Routledge, 1998), 120.

³⁸ Matthew Ostrowski, 'The Anxiety of the Client: Dilemmas of the Database as a Compositional Tool,' *Leonardo* 15/01 (Cambridge, Massachusetts: MIT Press, 2007), 2.

³⁹ Emery C. Martin, *Databergs* [sculpture, 2014] Available at <http://emerymartin.net/databergs> (Accessed 21st March 2022).

⁴⁰ Ostrowski, 5.

⁴¹ Mark Hansen, Ben Rubin, *Listening Post* [installation, 2001]. Available at <http://digiart21.org/art/the-listening-post> (accessed 19th March 2022).

Andrea Polli is an environmental artist who sonifies data. In her own words, she has “tried to use the sonification of climate and weather data and the visual impact of natural imagery to have a kind of emotional impact and raise awareness of climate issues.”⁴² Her work *Atmospherics* (1999) uses highly detailed weather data of two historic storms which devastated New York. Without adding or subtracting to the data, she electronically spatialises the sonification based on geographical and altitudinal locations of the storms. With the belief that every parameter of a historical storm can be recreated in data, Polli is peddling the idea of accessing a hyperobject entirely.⁴³ The complexity and turbulence of the storms is expected to be translated through the piece. Here lies what Ostrowski calls the anxiety of the client, in which the artwork is not performing any critique of instrumental reason.⁴⁴ *Atmospherics* is allowing the data the privilege of acting as a Platonic essence, some absolute truth. Such sonifications, which adopt the scientific language of chaos theory and emergent systems, cannot both reveal and retain the invisible footprints of reality.⁴⁵ Her work remains, although a highly sophisticated composition, simply as an aestheticised transfer of information.

Oil, Coal and Gas for Three Cellos (2020) by Jamie Perera is a composition which maps the graphs of historical fossil fuel consumption to a musical stave. Perera outlines his reasoning as such: “Sonifying an object to feel the issues and information within it is a small act in provoking conversation. For us it’s now a way to confront, express and experience the issues behind Climate Change, a practice that breaks down aspects of a seemingly impenetrable hyper-object.”⁴⁶ Yet applying graphs to pitch is a flattening of any complexity a hyperobject has. According to Dunn, there is a disturbing assumption that the mere status of music forms a meaningful discourse.⁴⁷ It dates back to John Cage’s

⁴² Andrea Polli, ‘Sonifications of Global Environmental Data,’ in *Environmental Sound Artists: In Their Own Words* Frederick Bianchi, V. J. Manzo (eds.) (Oxford: Oxford University Press, 2016), 3.

⁴³ Andrea Polli, ‘Hack the Grid: Public Art and Climate Change,’ *Data Art for Climate Action* [conference, 25th February 2022] Available at <https://youtu.be/0FeQyPuf6QI> (accessed 31st March 2022), 00:07:35.

⁴⁴ Ostrowski, 2.

⁴⁵ Morton, *Ecology Without Nature*, 192.

⁴⁶ Jamie Perera, ‘Oil, Coal and Gas for Three Cellos’ *We Make Tomorrow Summit* [conference, 26th February 2016] Available at <https://jamieperera.com/blog/#WeMakeTomorrowSummit> (accessed 3rd February 2022).

⁴⁷ Dunn, *Nature, Sound Art and the Sacred*, 3.

emancipation of music, in which all sounds could be a resource for composition. This set a precedent for the exploitation of sound as a decontextualised commodity. Sonification artists who create aestheticised transfers of information are hanging onto the assumption they are putting meaning into meaningless datasets.

Finally, there are works of ecological art which do not use data that are worth mentioning. Olafur Eliasson's *Ice Watch* (2014) is an installation of actual large ice blocks from Greenland that melt in front of the audience.⁴⁸ The viewer does not stand away from the ice but directly interacts with it by sitting on, lying on or touching the blocks. An anthropocentric interaction with the environment tends to be a one way conversation, about nature over yonder. *Ice Watch* is a dialogue with a nonhuman, the ice, echoing the importance of the relationship we have with the environment. Ecological awareness is not pristine or holy. Ecological art then cannot be of "uplifting poster-type grandeur. It must include ugliness and disgust, and haunting weirdness, and a sense of unreality as much as of reality."⁴⁹ I tentatively point to the much revered nature-inspired composer John Luther Adams with his works *The Become Trilogy* (Ocean, River & Desert) for evoking the anthropocentric notion of nature without humans. Where is *Become Landfill* or *Become Tarmac*?

These artworks have informed my own process of using data as a compositional tool and approaching ecological awareness in art. Avoiding to be didactic or make a scientific argument is central to the process of using data. In my work, it is not a matter of effective persuasion, I leave that to language and science, but of aesthetic influence. Disorienting spatiotemporal scales and warped nonhuman objects are portrayed in the four works I present. Data is used in three of the works, squeezing and stretching it acoustically, electronically and visually. Throughout the works my compositional process and research grow closer, forming a narrative of learning to engage with these topics artistically.

⁴⁸ Eliasson, Olafur, *Ice Watch* [installation, 2014] Available at <https://olafureliasson.net/archive/artwork/WEK109190/ice-watch> (accessed 21st March 2022).

⁴⁹ Morton, *Being Ecological*, 138.

North Atlantic [→ view work on Research Catalogue](#)

North Atlantic (2021) began as a curiosity into data sonification and visualisation at the very beginning of my research in late 2020. Before learning about Dark Ecology, I was perhaps interested in finding out if I could create an emotional reaction to data. During the process and furthering my research I realised my naivety towards sonification. It was an utter simplification and merely an aestheticised transfer of information. From getting involved in a project with MAZE Ensemble through the composition department, I started to experiment with contrasting murky and dark improvisational instrumental music against the data-driven media. This was to evoke the withdrawn quality of the hyperobject that is the North Atlantic trade winds in contrast to the data representation of it. In this chapter I provide the technical and aesthetic approach used in the composition process.

North Atlantic was composed for fixed audio-visual media and MAZE Ensemble: Anne La Berge, flute; Dario Calderone, contrabass; Gareth Davis, bass clarinet; Reinier van Houdt, piano; Wiek Hijmans, electric guitar; and Yannis Kyriakides, computer and electronics. The piece, made up of sonification, visuals and video scores, is entirely based on wind speed data over the North Atlantic Ocean. It is an incredibly indeterminant composition, not only in the improvisational instrumental writing, but every performance is based on the wind forecast for the respective week. The data is extracted from pixel information of screen-recorded videos of wind speed maps from the website windguru.com.

The sonification is made with the programmes TouchDesigner (TD) and Ableton Live 10. In TD the resolution of the wind map is drastically reduced to a 20x4 grid. The wind speed is correlated to the amount of red in a pixel (r-value). This value is dynamically read and sent to Ableton. The twenty rows are pitches of simple oscillators and the four columns are output channels of a quadrophonic setup. The scale used is five equal divisions of the octave (5-edo) in A, a microtonal pentatonic scale.⁵⁰ The r-values control the amplitude of the oscillators in Ableton. Overall, the wind speed determines the

⁵⁰ 5-edo scale in A: A +0¢, B +40¢, D -20¢, E +20¢, G -40¢.

loudness of the oscillators with increasing pitch relating to a more northern pixel and each output spatialised left to right, corresponding west to east (see fig.1).

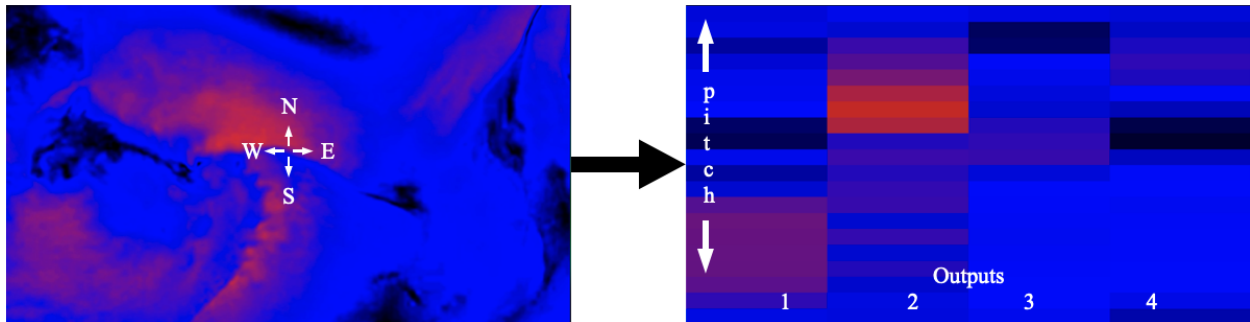


fig.1 - The resolution reduction to make a 20x4 grid with r-value controlling oscillator amplitude.

The visuals are made in TD. The two-dimensional map is turned into two separate three-dimensional planes with differences of colour and shape. The edges trail off into a dark shadow and the camera pans slowly around as the 3D model of the wind undulates (see fig.2).

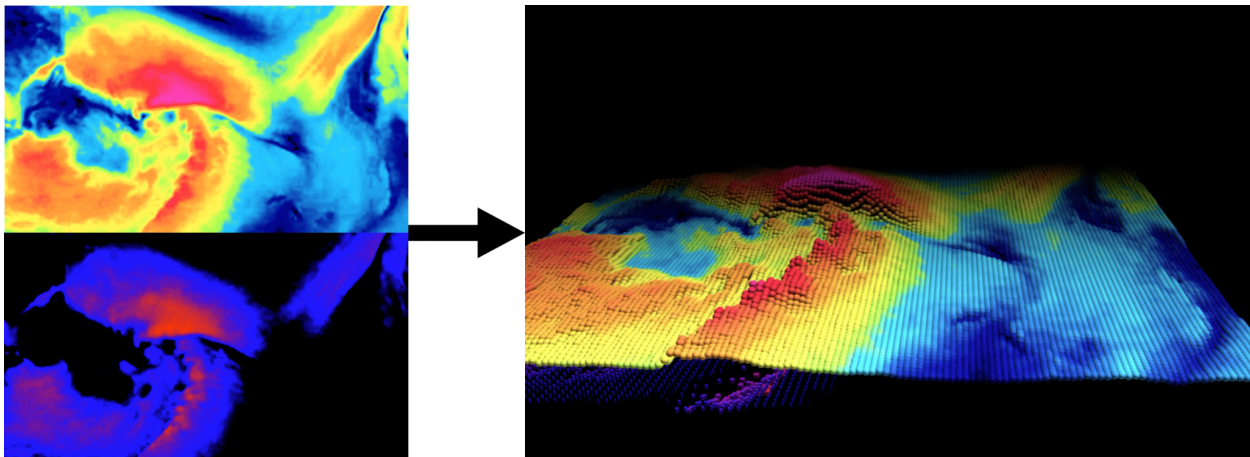


fig.2 - The different coloured maps used to create the 3d model.

The aesthetic of the audio-visual wind model aims at giving a sense of a flattening of complexity. Climatic systems are hyperobjects, of which we can only access slices of them, a notion which is portrayed here. The climate is not just a graph of weather events and cannot be reduced to its component parts, there is something beyond.⁵¹ The sonification with its pentatonic tuning and simple oscillators is harmonically and timbrally flat. The 3D planes are literal slices placed in a dark abyss alluding to something

⁵¹ Morton, *Being Ecological*, 76.

withdrawn and out of reach. This is the ambient backdrop to the piece. Ambient art, as Morton says, “wishes to retain the flavor [sic.] of the unknown, a certain mystifying opacity —otherwise ambient art would in fact be science.”⁵²

The withdrawn beyond-ness of the hyperobject is represented in the instrumental parts. MAZE are a highly sophisticated improvisation ensemble who are well attuned to playing with each other and are a complex system in their own right. The score is a video of

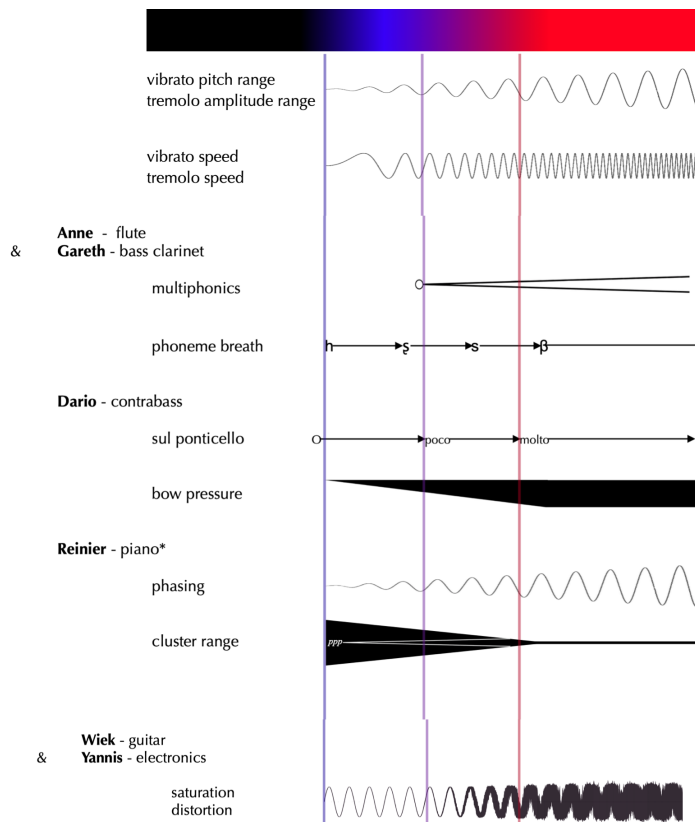


fig.3 - Global and individual instrumental techniques assigned to wind speed.

the wind map in which every player occupies a particular hexagonal area. The player is given a unique video with their hexagon and the surrounding area of the neighbouring hexagons. Similar to the sonification, the wind speed is mapped to parameters. These parameters are timbral changes and techniques which are specified for every instrument (see fig.3). The correlation between wind speed and timbre is not meant to be followed with absolute strictness but instead provide a palette of textures for the musicians. The 5-edo scale is also used as the pitch set for the instruments with an exception for the piano, of which similarly tuned notes are applied. While this scale is always clean and harmonious in the sonification, noisy and harsh textures within the instruments distort this cleanliness. Notes are sustained but can be changed when a new bout of wind enters one’s hexagon. A player can tune to their neighbour when they share a bout of wind also.

These layers, although composed from the wind maps, are to avoid the sense of orthogonality, a one-to-one mapping of a graph to music. The form of the piece is

⁵² Morton, *Ecology Without Nature*, 96.

determined by the wind forecast and allows for, what I call, stasis. Stasis is a form concerned with micro climaxes and ambience, the music being in constant flux yet immutable. This form is explored in later works. The duration of the piece is malleable as the forecasts can be condensed to any time (e.g. a week's forecast in eight minutes). Inspired by the idea of attuning to the shifting state of our planet at a range of different scales, the compression of timescales to fit the human ear is not entirely favourable.⁵³ Instead, a juxtaposition of scales could create more depth rather than putting a lens on just one. This idea is developed in the proceeding works and could be an improvement in future iterations of this piece.

Although its title is *North Atlantic*, this project could of course take wind data from anywhere. It is a piece in which I can never put the score on the shelf. For every performance, a new audio-visual model and set of video scores must be made. In order to collate all the documentation for each rehearsal and performance, I made a webpage where the musicians can access the most up-to-date videos: richardhughes.ie/wind. The performance included with this research paper is from 25th April 2021 in TivoliVredenburg, Utrecht played by MAZE Ensemble.

⁵³ *Coventry Biennial: HYPER-POSSIBLE - Listening to the Anthropocene* [exhibition, 2021] Available at <https://coventrybiennial.com/exhibitions/listening-to-the-anthropocene> (accessed 28th October 2021).

Losing Using Language

Teanga - Tongue

Earlier in this paper, language as a priority mode of accessing the world was discussed. Within the domain of linguistics there exists again, unfortunately, another hierarchy. Linguistic chauvinism, as defined by linguist Ross Perlin, is a stigma toward minority languages held by majority languages.⁵⁴ It is a force contributing to the mass disappearance of languages and cultures around the world. Linguistic chauvinism is part and parcel of capitalism. We hardly realise how capitalist mentalities are deeply embedded in our language—how we talk about time, space and relationships.⁵⁵ Immense efficiency and the supreme value of monocultures and monolingualism is tied to the fantasy of an all-powerful subject who can indefinitely exploit the nonhuman world.⁵⁶ Ecological awareness is dependent on the appreciation of the local. To appreciate the local we must have a particularising language for it. Indigenous and minority languages, which have a more embedded relationship between human and nonhuman, prove to be another necessary tool in an era of environmental crisis.⁵⁷ From the standpoint of OOO, no one way of accessing an object can grasp its entirety. No one language and no one culture can fully grasp an ecology, let alone an ecological crisis. There is a correlation observed around the world between linguistic diversity and biodiversity called bio-cultural diversity.⁵⁸ The beauty of diversity, then, seems encouraging:

⁵⁴ Ross Perlin, 'Radical Linguistics in an Age of Extinction,' *Dissent* (Summer 2014) Available at <https://dissentmagazine.org/article/radical-linguistics-in-an-age-of-extinction> (accessed 20th March 2022).

⁵⁵ *Ibid.*

⁵⁶ Morton, *Being Ecological*, 152.

⁵⁷ Michael Cronin, *An Ghaeilge agus an Éiceolaíocht - Irish and Ecology* (Dublin: Foilseacháin Ábhair Spioradálta, 2019), 16.

⁵⁸ Ben Ó Ceallaigh, 'The Green New Deal: a window of opportunity for minoritised languages?,' *Gŵyl Ymchwil Her yr Hinsawdd*, University of Aberystwyth [conference, 22nd October 2021] Available at <https://youtu.be/ldIkeCLZlts> (accessed 20th March 2022), 00:11:30.

Is éard atá i chuile chultúr iarracht faoi leith a rinne an duine le dhul i ngleic leis an saol nó, lena rá ar chaoi eile, athleagan bunúil den saol daonna... [tá] ilghnéitheacht seo an chultúir fíorspéisiúil, fíorálainn, ar nós fhoirmeacha iomadúla na beatha féin.⁵⁹

Every culture represents a different collective human effort to come to grips with the world, an original version of human existence... This multifariousness of human culture is in itself of great interest and beauty, like the innumerable forms of natural life.

In the case of Ireland, there exists the minority language of Irish which is met with linguistic chauvinism and contains forms of accessing beyond the scope of English. Language gives perspective to the landscape. Homogeneous, blank spaces turn to localised, particular places when a language, such as Irish, deepens the viewer's perspective on their environment. An exemplar of this is our wealth of place names in Irish, which are nonsensical in English. Place names and the topographical lore built into them are central to Gaelic culture.⁶⁰ Every nook and cranny of hills, mountains, islands and fields have names with embedded meanings. The way the land may appear empty is not a relic of an ancient past but a function of modernity.⁶¹

Mara bhfuil aon ainmeachaí ar na garrantaí níl tú in aon áit.⁶²

If there are no names on the fields you are in no place.

As has been expressed, our model of modernity is failing us when trying to adopt nonviolence towards nonhumans and an appreciation of scales in our ecological awareness. Mired in dualism, our Western ways of thinking are compromised beyond repair. A new ecological view derives from an aesthetic experience of the world around us.⁶³ Irish allows for such a view. A concept that was central to the old Irish beliefs concerning the environment was:

⁵⁹ Comhaontas Glas, Polasaí Teanga An Chomhaontais Ghlais - Green Party Language Policy (1993), 4.

⁶⁰ Cronin, 13.

⁶¹ Morton, *Ecology Without Nature*, 86.

⁶² Roibeard Ó Maolalaigh, 'Tírdhreach na nGael: logainmneacha agus an t-samhlaíocht,' in *Cruth na Tíre* Wilson McLeod, Máire Ní Annracháin (eds.) (Dublin, Ireland: Coiscéim, 2003), 195-243 (195).

⁶³ Val Plumwood, *Environmental Culture: The Ecological Crisis of Reason* (London, UK: Routledge, 2002), 230.

[Bhí] an rí pósta ar bhandia na talún is go raibh cumhacht speisialta ag an bhfile mar idirghabhálaí idir an chríoch dhaonna a bhí faoi réir an taoisigh agus críocha nádúrtha agus osnádúrtha an bhandé.⁶⁴

The king was married to the female deity of the land and the poets had a special power as intermediaries between the human domain that was subservient to the chiefs and the natural and supernatural domain of the female deity.

Intermediaries (artists, writers, intellectuals and creatives) act as the bridge between the human and nonhuman. The Irish language tradition should not be restricted to sentimentalism but can instead be about the realistic future of the environment.⁶⁵ Such a tradition includes the practice of art as a central form of accessing the world. Tolerating, appreciating and accepting strangeness and the uncanny is within the scope of Irish. Ecological awareness is an awareness of scales that disorientate. Irish, although dwarfed by geological time, goes back far enough to create a perspective of the long view with at least two thousand years of recorded experience. There are bewildering, murky and hazy glimpses of this deep insight encased within Irish.⁶⁶ Words and place names that stretch to deep history become uncanny. Art, through the Irish language perspective, can be an even more powerful tool for ecological awareness in Ireland.

Mo Ghaeilge - My Irish

Roughly 2% of the population of Ireland live in designated regions for the Irish language, called *Gaeltachtaí*. I grew up in anglophone Ireland, but there was always an affinity for the Irish language at home. It wasn't until emigrating (first to Quebec and then the Netherlands), when I was surrounded almost entirely by people using English only as a *modus operandi*, that I felt a sense of linguistic identity to Irish, my second language. In summer 2021, I lived for three months in the Gaeltacht island of Inis Oírr to ascertain a level of fluency in the language. Working and living with native speakers in fields and

⁶⁴ Louis de Paor, *Ag Caint leis an Simné: Dúshlán an Traidisiúin agus Nualitriocht na Gaeilge* (An Spidéal, Ireland: Cló Iar-Chonnacht, 2018), 23.

⁶⁵ Cronin, 21.

⁶⁶ Manchán Magan, *Thirty-Two Words for Field: Lost words of the Irish landscape* (Dublin, Ireland: Gill Books, 2020), 161-2.

gardens by the sea is how I arrived at seeing Irish as an imperative ecological tool. The landscape, generally taken for granted in its undescribed banality, became alive with a new perspective. Take for instance, the use of cardinal directions instead of relative directions (right and left) to locate things—“pass me the cup to the west.” This is a feature of one third of the world’s languages, mainly endangered ones.⁶⁷ Rather than an anthropocentric description of the world, Irish speakers perceive objects in relation to the world, not themselves.

The lack of rigid distinctions between human and nonhuman within indigenous groups, as anthropologist Elizabeth Povinelli describes, is geontology.⁶⁸ Irish has this geontology as seen from its particularising vocabulary of the environment, for fields, stones, seaweed, local vegetation, etc. My change in perspective resonates with political theorist Jane Bennett’s argument for *vital materiality*, “the idea of matter as passive stuff, as raw, brute, or inert” is so because “the quarantines of matter and life encourage us to ignore the vitality of matter and the lively powers of material formations.”⁶⁹ The quarantine refers to the disconnect between human and nonhuman, the anthropocentric subject standing against the world around them. Yet it is not that Irish illuminates the environment it grew from completely, rather it is another valuable mode of access. Just as OOO accepts the world is mysterious, Irish is rooted in the enchantment of the world with its strong traditions of mythology and toponymy.

Irish is now central in my life. The piece I present below, while short in length, is the culmination of research and personal and artistic development. Rather than portraying the often traditional aesthetics of Irish culture and language, I hope to evoke a future-oriented approach to Irish and the perspective it gives to me. As someone who grew up in anglophone Ireland, accepting and appreciating the uncanny is a useful asset for Irish language learning. Uncanny, as the language seems familiar but it is at the same time unfamiliar, as the nationalist assumption that the language should come naturally is

⁶⁷ Michael Bond, *Wayfinding: The Art and Science of How We Find and Lose Our Way* (London, UK: Picador, 2020), 151.

⁶⁸ Elizabeth Povinelli, *Geontologies: A Requiem to Late Liberalism* (Durham, North Carolina: Duke University Press, 2016), 5.

⁶⁹ Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham, North Carolina: Duke University Press, 2010), vii.

outdated.⁷⁰ The humility that comes with tolerating the unfamiliar is then an ecological virtue.

feamainn - seaweed → [view work on Research Catalogue](#)

In 2021, I received a commission from Crash Ensemble (Ireland) to write a two-minute piece. Inspired by Bennett's idea of vital materiality, I wanted to create a multimedia work about a nonhuman becoming more vibrant because of a certain linguistic feature of Irish. The feature I chose was the vocabulary for seaweed. On Inis Oírr in August, we harvested *coirleach* (*laminaria digitata*) to be used as a fertiliser in gardens (see fig.4) and we picked *sleabhac* (*porphyra*) to dry out and eat. The use of many other seaweed (*míoránach*, *ríseach*, *dúlamán*, *scothach*) is known simply because a specific vocabulary exists for them.



fig.4 - *Coirleach* being harvested (top), using it to fertilise new vegetable ridges (bottom).

Rather than just a homogenous 'seaweed', a myriad of ecological information came forth from a native language. I wrote the piece not with the intention of it to be only appreciated by Irish speakers but to share the feeling of a changing ecological perspective for any audience.

feamainn (2021) is written for violin, viola, cello, double bass, clarinet and fixed media (audio and visuals). The composition is made up of two primary layers: the visual text and sound files; and the seaweed footage and instrumental music. The audio-visual media is made using Javascript, Max/MSP, TD and Ableton. It incorporates footage of seaweed (filmed by Evangéline Durand-Allizé) taken on Inis Oírr and the entire corpus of 84,000 sound

files webscraped from *An Bunachar Fograíochta* (the Irish Pronunciation Database). These sound files are manipulated in Max/MSP to create an Irish word scrambler in which speed, length and position are controllable. They could be played back in ways in which single

⁷⁰ Cronin, 56.

phonemes are scrolling through our ears or a word is stretched multiple times its original length. While the data of the language might be at my fingertips, the comprehension of it is another question. Irish has a rich oral heritage as evidenced by *sean nós* singing and its storytelling tradition which both exist strongly today. Irish words were not merely composed of an arrangement of symbolic letters but largely existed through an embodied medium, vocalised and heard as sound.⁷¹ The digitally processed words, which are necessary for the language's preservation, are legions away from the perspective given by a lived experience with the language.

The visuals are made in TD using the text of the words and the footage of seaweed. I made an effect in which each word visually glitches to the next in a way that almost no word is legible, making it unfamiliar. Using a Gaelic script font, the torn up letters remain recognisable as Irish and somewhat familiar. This strange feeling is echoed in the warping of the footage, moving from a 2D image to a 3D plane. The seaweed gets stretched and distorted into abstract forms. This happens when the text and footage stops on a word for seaweed. The viewer is shown a vital materiality within.

[Tá] castacht agus doimhneacht ag
baint leis na heachtraí is suaraí dár
saol laethúil.⁷²

There is complexity and depth in
the smallest, most mundane events
of our daily lives.

The Irish language is a hyperobject spanning a staggering timescale of a few millennia. Even seaweed and its evolution is a hyperobject. We are accessing both of these only in the present. The visual feedback effect aims to induce the feeling of a fourth dimension, time, falling backwards into an abyss. Irish is, with no doubt, a language in crisis. Words which provide an embedded perspective are melting away generation by generation.

Just as the sound files are the counterpart of the glitched text, the instrumental music serves as a musical analogy for the seaweed. This is to juxtapose the digital against the analog. The instrumental writing was partly inspired by Yannis Kyriakides' work *Toponymy* which deals with place names in Cyprus and the complex cultural meaning in

⁷¹ Magan, 162.

⁷² Cronin, 51.

them.⁷³ The string parts in that work are composed using a method of embedded words in the music, while my writing followed a more intuitive approach. Composed mostly in a lydian mode, the strings are interlaced to be a uniform texture. Considering the links between media, I refer to Kyriakides' definitions of convergence and divergence with regard to space, time (synchronicity) and scale within a multimedia work.⁷⁴ There is a high degree of convergence in the synchronisation of the seaweed visuals and the instrumental music. The image scrolls through different shots of seaweed when the musical phrases are played. The visuals rest on one shot when a sustained note is held. I would argue the scale of the seaweed footage and music is divergent. The seaweed is small and the music is quite prominent. The musical analogy of the seaweed elevates its aesthetic representation.

There are three points in the piece in which the word (visual and aural) stops on a type of seaweed and the image matches it. Here is when there is an undulating distortion of the word, image and music. The clarinet outlines the melodic quality of the word. The strings glissando in and out of consonance and dissonance to create a sense of contorting the seaweed upside-down and inside-out. The dramaturgy of the piece is ever increasingly tense and restless but divided by these slower, more liquid parts.

Crash Ensemble will take *feamainn* on tour with them in summer 2022, so it has not received a premiere yet. For this paper, I provide a documentation of the piece with Pedro Latas as sound technician, conducted by Charles Baumstark and played by: Giuseppe Sapienza, clarinet; Sacha Paredes Sánchez, violin; Irene García Barrera, viola; Nikos Maridi, cello; and Simon Tóth, contrabass.

Perhaps the most amount of research, thought and compositional choices of the four works presented in this paper went into this two-minute piece. The nature of this project meant I would write a pithy work. It is without doubt that dealing with the Irish language will be a central topic in my future, more long form, work. The Irish language: not as a proud nationalist emblem, but as an ecological virtue.

⁷³ Yannis Kyriakides, *Toponymy* [programme note, 2014] Available at <https://kyriakides.com/toponymy.html> (accessed 30th December 2021).

⁷⁴ Yannis Kyriakides, *Imagined Voices: A Poetics of Music-Text-Film* (Ph.D thesis, Leiden University, 2017), 68.

Data Is Ephemeral → view work on Research Catalogue

Data is a tool for humans to empirically measure something ungraspable by our senses. It shows us that we exist on many scales: temporal scales such as seasonal, lifetime, generational, historical and geological ones; spatial scales such as household, neighbourhood, city, country and global ones. Humanity is not an object we can easily point to as it exists on these myriad of scales. This is why humanity is a hyperobject. We vaguely sense hyperobjects from our peripheral vision while data lies in front of our eyes. This reminds us of how we exist simultaneously on multiple scales, that the local and the present is in fact uncanny.⁷⁵ Data has made us consider ourselves as a geological force responsible for the current global mass extinction. Morton considers the term Anthropocene an anti-anthropocentric idea as it allows us to think of humanity “as a hyperobject that is real yet inaccessible.”⁷⁶ Such massively distributed objects cannot be grasped empirically. Hyperobjects are not completely revealed and illuminated by data. We only access slices of them. We access them, through data, ephemerally.

Data Is Ephemeral (2022) is a work composed for chamber ensemble and live audio-visual media. This piece has existed in two forms: notated for non-improvising musicians (alto saxophone, classical guitar, harpsichord, clarinet, trombone and cello) and

$$\begin{array}{c}
 \textit{letter} = (x, \quad y, \quad z) \\
 \begin{array}{ccc}
 \parallel & \parallel & \parallel \\
 \left[\begin{array}{c} n_0 \\ n_1 \\ n_2 \end{array} \right] & \left[\begin{array}{c} Eb \\ F \\ G \end{array} \right] & \left[\begin{array}{c} A \\ Bb \\ C \end{array} \right] & \left[\begin{array}{c} D \\ Db \\ Ab \end{array} \right]
 \end{array}
 \end{array}$$

$$\begin{array}{l}
 \text{e.g. } h = (1, 2, 0) \\
 = (F, C, D)
 \end{array}$$

fig.5 - Every letter is an element in a 3x3x3 matrix which corresponds to a three-note motif.

instruction-based for improvising musicians (electronics, cello, electric guitar and processed violin). Performances of both are included in the documentation of this paper. The ensemble is divided in two: one half called *Data*, the other called *Hyperobject*.

Data play short pointalistic gestures of music strictly together. In the non-improvised version, made up of alto saxophone, classical guitar and harpsichord, the phrases are composed by embedding words into music. The method entails

⁷⁵ Morton, *Dark Ecology*, 11.

⁷⁶ *Ibid.*, 25.

INPUT														
ephemeral		x	y	z										
SPLIT	BASE3	eb,f,g	a,bb,c	d,db,ab	x	y	z		INT1	INT2	INT3			
e	110	1	1	0	F	Bb	D		F	Eb	F			
p	021	0	2	1	Eb	C	Db		Bb	C	C			
h	120	1	2	0	F	C	D		D	Db	D			
e	110	1	1	0	F	Bb	D		F	Eb	F			
m	011	0	1	1	Eb	Bb	Db		Bb	Bb	Bb			
e	110	1	1	0	F	Bb	D		D	Db	D			
r	221	2	2	1	G	C	Db		G	Eb	G			
a	000	0	0	0	Eb	A	D		C	A	A			
l	201	2	0	1	G	A	Db		Db	D	Db			

fig.6 - Words are encoded to pitches algorithmically using an excel sheet. A word is spelled out between instruments in rotation.

assigning every letter of the alphabet to an element in a 3x3x3 matrix, such that $a = (0,0,0)$, $b = (1,0,0)$... $z = (1,2,2)$. There are 27 elements in this matrix, but only 26 in the alphabet: the final element, $(2,2,2)$, is reserved for any other character. Each letter refers to three column vectors to translate the letter to a unique three-note motif (see fig.5). To spell a word, the motifs are spread over each instrument in a specific rotation (saxophone, guitar, harpsichord). While pitches are decided algorithmically, phrasing and rhythm are composed intuitively (see fig.6). As the composer, it is not my intention for the listener to decode these words when hearing the piece. Rather, I wanted to create a consistent method of composition in order to create a sense of data-ness. The embedded text is as follows:

Data is ephemeral.

If we cannot measure it, we cannot know if we progress.

Humanity cannot access hyperobjects by data alone.

The middle line is taken from a speech I heard about the use of data in business. It sums up how capitalism prevents the appreciation of the unknown and the ambiguous. These words are also projected individually as part of the live visual media. In the improvised version, performed on cello and electronics, the only correlation between the words and the phrases is the length. The longer the word, the longer the phrase. Pitch and rhythm are improvised. The cello plays fast, harsh phrases with an increasing pitch

throughout the piece. The electronics employ a vocoder manipulating words from data headlines. The vocoder glitches and transposes the words. It is controlled using Myo sensors in which muscle tension and the movement of the player's arms are the parameters. This adds a layer of performativity in which a speechless player embodies the words in the media. In both versions, the phrases begin separated by long periods of silence and inch closer together throughout the piece. This aims to increase the tension as the piece progresses.

Hyperobject is a completely disconnected subset of the ensemble. It exists on a different timescale. Its sound is more expressive, continuous, slow and murky. In both versions I write undulating glissandi to evoke the withdrawn quality of hyperobjects. Stasis is used as a form here in which there are no obvious climaxes. *Hyperobject* is a sculpted moving drone.

There are three sections in the piece. In the first section, the interval of glissando is between a minor seventh and minor tenth. The second section is complete silence, in which *Data* continues to spurt out in seemingly random moments. In the third section, the interval of glissando is then stretched between a compound minor seventh and compound major ninth. The glissandi are not straight lines between pitches but imperfections are added to them. In the non-improvised version, the cello plays the bottom line and trombone the top line. The clarinet enters infrequently and plays bisbigliandi on a single note to help colour the drone. This allows the trombonist time to breathe in what is otherwise a mostly continuous sound. The harmon mute is also used on the trombone to add a slight texture and tremolo effect at times. To heighten the tension of the piece, dynamics are ever increasing and more *sul ponticello* played on the cello. Similarly in the improvised version, played on electric guitar and processed violin, noisier textures are added gradually throughout. The improvisers focus on melding their sound together as one entity.

The live audio-visuals are made up of the text mentioned above and a list of data headlines. These headlines are webscraped from the subreddit [r/dataisbeautiful](#). It is an online forum where people share personal, local, national and planetary data. Dreadful and horrific headlines contrast with lighthearted and amusing ones: *Armoured Vehicle*

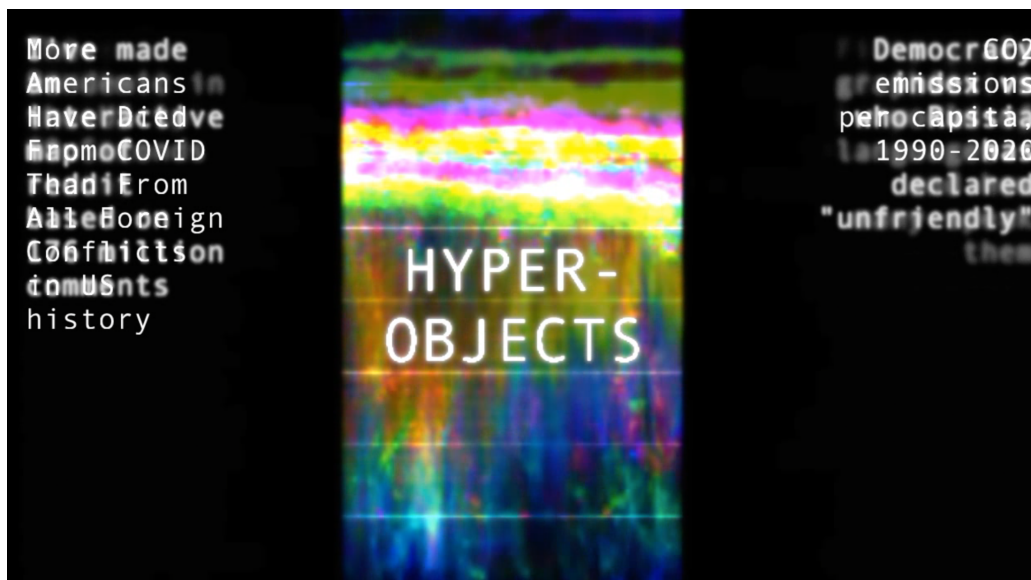


fig.7 - A still of the projection with data headlines on either side, the embedded word in the middle and graph-like visuals.

Losses in Russia-Ukraine War 2022; Slices of Pizza I Ate in 2021. It poignantly presents the scales at which humanity exists. *Data* triggers the visuals when they play the short phrases. While the phrase is being played the headlines rapidly scroll along the projection with a synchronous ticking sound. The corresponding embedded word of the phrase also appears in the middle (see fig.7). The visuals then fade out until they are triggered again. All visuals are made and run in TD. I am interested in how the reading of the text affects the audience. Their inner voice is then part of the piece, just as reading headlines on our phones or newspapers is part of this inner monologue.⁷⁷ In the improvised version, the visuals include abstract forms which resemble graphs. With the projection mapped onto objects of the wall where the performance is held, this gives a feeling that the room is a computer which we are inside—humans condensed down to information.

The improvised version was performed 7th April 2022 as part of Spring Festival by an ensemble I play in called Aduantas (Irish for ‘a strange feeling in an unfamiliar place’) made up of: Isaac Barzso, electric guitar; Rose Connolly, processed violin; Pedro Latas, live electronics; and myself playing cello. The non-improvised version was written for an ensemble as part of an exchange project with Janáčkova Akademie Múzických Umění, Brno, Czech Republic, performed in The Hague 25th February 2022 by: Giuseppe Sapienza,

⁷⁷ Kyriakides, *Imagined Voices*, 141.

clarinet; David Derner, trombone; Nikos Maridis, cello; Diego Flamarique Unanua, alto saxophone; Artem Pozdniakov, classical guitar; Vendula Galdová, harpsichord; and conducted by Lubomír Zelenák.

Informed by my research into the use of data in art, *Data Is Ephemeral* aims to evoke a feeling towards our relationship to data and how we are understanding the world around us. It portrays an obsession with data on multiple scales encased within dark, eerie drones. The structure of the piece allowed for new experimentations with different ensembles and triggering live visuals. Although the piece has only existed in concert settings, I believe it could be a bridge to making installation work involving interactivity with an audience.

Veering

→ view work on Research Catalogue

In an age of ecological crisis, humans are now faced with the task of thinking of spatiotemporal scales much larger and much smaller than the ones we are used to. There are nonhumans installed at every level of humanity, such as our bacterial microbiome or our global CO₂ emissions. *Ecognosis* is this attunement space which considers nonhumans in the biological, cultural and logical levels of humans.⁷⁸ We are not independent but interdependent objects. We affect and are affected by nonhumans. An organism's DNA expression does not end at its body. A spider builds a web, a beaver builds a dam, a bird builds a nest. This is their phenotype. Humanity's phenotype covers much of Earth's surface and continues down into its crust.⁷⁹ This is why we are living in the Anthropocene. Whether we are aware of humanity as a geological agent or not, here we are, *being* a part of it.⁸⁰ Our heart beats autonomically and CO₂ emissions rise without needing any knowledge of the process. An awareness of these scales helps us with realising that an action on a small scale can have an entirely different effect on a large scale. The effects of only two centuries of industrialisation on global warming will last tens of millennia.⁸¹ Writer and social activist Naomi Klein provides a useful analogy for considering abnormal scales:

Climate change is slow, and we are fast. When you are racing through a rural landscape on a bullet train, it looks as if everything you are passing is standing still: people, tractors, cars on country roads. They aren't, of course. They are moving, but at a speed so slow compared with the train that they appear static.⁸²

⁷⁸ Morton, *Dark Ecology*, 159.

⁷⁹ Morton, *Being Ecological*, 197.

⁸⁰ Morton, *Dark Ecology*, 21.

⁸¹ Jonas Van Breedam, et al., 'Semi-equilibrated global sea-level change projections for the next 10 000 years' *Earth System Dynamics* 11/4 (2020): 953-976.

⁸² Naomi Klein, 'Climate Change Is the Fight of Our Lives - Yet We Can Hardly Bear to Look at It,' *Guardian*, 23rd April 2014 Available at <https://theguardian.com/commentisfree/2014/apr/23/climate-change-fight-of-our-lives-naomi-klein> (accessed 5th March 2022).



fig.8 - A still of the 2x2 grid of the visuals

Veering (2022) is written as a poetic analogy of these thoughts. It is composed for solo viola and live audio-visual media. The title is inspired from Morton’s use of the term, “Ecognosis has to do with allowing for this nonsensical, pestiferous dimension of things. A thought, a lizard, a spoon veer from themselves.”⁸³ I apply this term to evolution. Organisms don’t evolve to be a certain thing or have a certain trait. There is no destination or goal regarding evolution. Instead, everything is always veering. The solo viola plays single pitches in time with a delay channel, replaying what has been played. The viola acts as the present. The note it plays will have a different effect in the everchanging textural and harmonic structures of the piece which play out through the delay channel. Evolution never reaches perfection or stands still. The same can be said for the music in this piece. It does not resolve nor remain completely static. It is constantly veering. This is an essential aspect of the form stasis—in constant flux yet immutable.

The visuals are triggered in TD by the viola, but only with roughly a 10% chance. This was done to avoid direct convergence between the media while creating some counterpoint between the music and visuals. The viewer also has time to focus on the footage. I was influenced by composer Phill Niblock’s *6 Hours of Music and Film* where he projects four videos as a 2x2 grid.⁸⁴ The videos turn off and change indeterminantly, which

⁸³ Morton, *Dark Ecology*, 96.

⁸⁴ Phill Niblock, *6 Hours of Music and Film* [film, 2020] Available at <https://youtu.be/xnkD3fcXF0s> (accessed 20th March 2022).

doesn't reveal any visual rhythm. The visuals act in a similar way in *Veering* but the content is different. It is made up of footage I took around where I live in The Hague. The footage is of mundane events: buildings, cars, trams, bikes, canals, ponds, parks, deer, ducks and coots (see fig.8). Each provides their own tempo to the visuals. These different tempi act as the various timescales which surround us. The static shot aims to allow the viewer a sort of microspeciation on these mundane events and to reflect on these different scales. The local becomes uncanny. The indeterminate nature of the delay channel and the visuals are central to the piece's concept—that reality is incidental and veering. Ecological awareness is an awareness of unintended consequences.

Veering was written for violist Michelle Pritchard and will receive its premiere as part of a concert series on contemporary viola music she is undertaking in summer 2022. She performed the piece with Pedro Latas as sound technician as provided in the documentation for this paper. While workshopping the piece, I created an online delay channel to be used as a rehearsal tool by Michelle.⁸⁵ She could get a feel for playing with a delay only using her phone and without having to install any software.

It is the only piece, as part of this paper, which doesn't employ data in any way. Composing multimedia works which act as a poetic analogy for ecological awareness could widen the scope of discourse to deal with for me as a composer. This piece could be developed for other solo instruments and have a longer form.

⁸⁵ Online delay channel available at <https://richardhughes.ie/delay> (accessed 17th April 2022).

Conclusion

The climate data is in and we, as humanity, have suddenly become aware of the ecological crisis we are facing. There is, of course, a need to analyse such data and make effective arguments for political and individual action. Art on the other hand should not inhabit the world of effective argumentation. An individual's rational mind can be changed by facts and data. An individual's irrational, subconscious mind is influenced aesthetically. *Show, don't tell* is the golden rule taught to students beginning creative writing. It is a technique which advocates for the narrative power of experience, feeling and emotion rather than articulating, describing and summarising. This is what aesthetic influence can be. Data, and the art made from it, sometimes gets bogged down in trying to tell and illuminate the dark unknown. In this paper I have discussed why the appreciation, tolerance and acceptance of ambiguity and strangeness is an asset to ecological awareness. Art, by its very nature, allows for such appreciation of vagueness and the uncanny. While my work is informed by concrete ideas about ecological awareness, minority languages and our relationship to data, I reserve its right to partly exist in abstraction and ambiguity. I hope for my work to resonate with people poetically.

The motivation to compose multimedia work comes from an artistic desire as well as wanting to more easily engage in ecological issues using text and visuals. I have received a musical education throughout most of my life (piano, cello and composition), but never an education in the visual arts. I am self-taught at making visual media and creative coding. This year, I have applied for funding from the Arts Council of Ireland to receive mentorship from audio-visual artist Darien Brito. This will allow me to professionally learn TouchDesigner and Python and apply them more proficiently in my work. Moving forward, I would like to continue this research into ecological awareness in more immersive, interactive and longer form works that exist outside the concert hall. I am involved with Irish record label *The Department of Energy*, a label concerned with socially engaged art in Ireland with a particular focus on ecological issues.⁸⁶

⁸⁶ *Department of Energy* Available at <https://thedoe.org> (accessed 17th April 2022).

Ecognosis means including nonhumans within the human. By realising there are nonhumans installed at all levels of humanity, we might rid ourselves of an anthropocentric view of the world, and approach nonhumans with nonviolence. We don't have to know every factoid of ice melting and species going extinct to be ecological. Here we are breathing air and with an autonomic nervous system—symbiotic beings entangled with other symbiotic beings. Art is a powerful tool to realise and contemplate this. Art can enhance our ecological awareness.

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