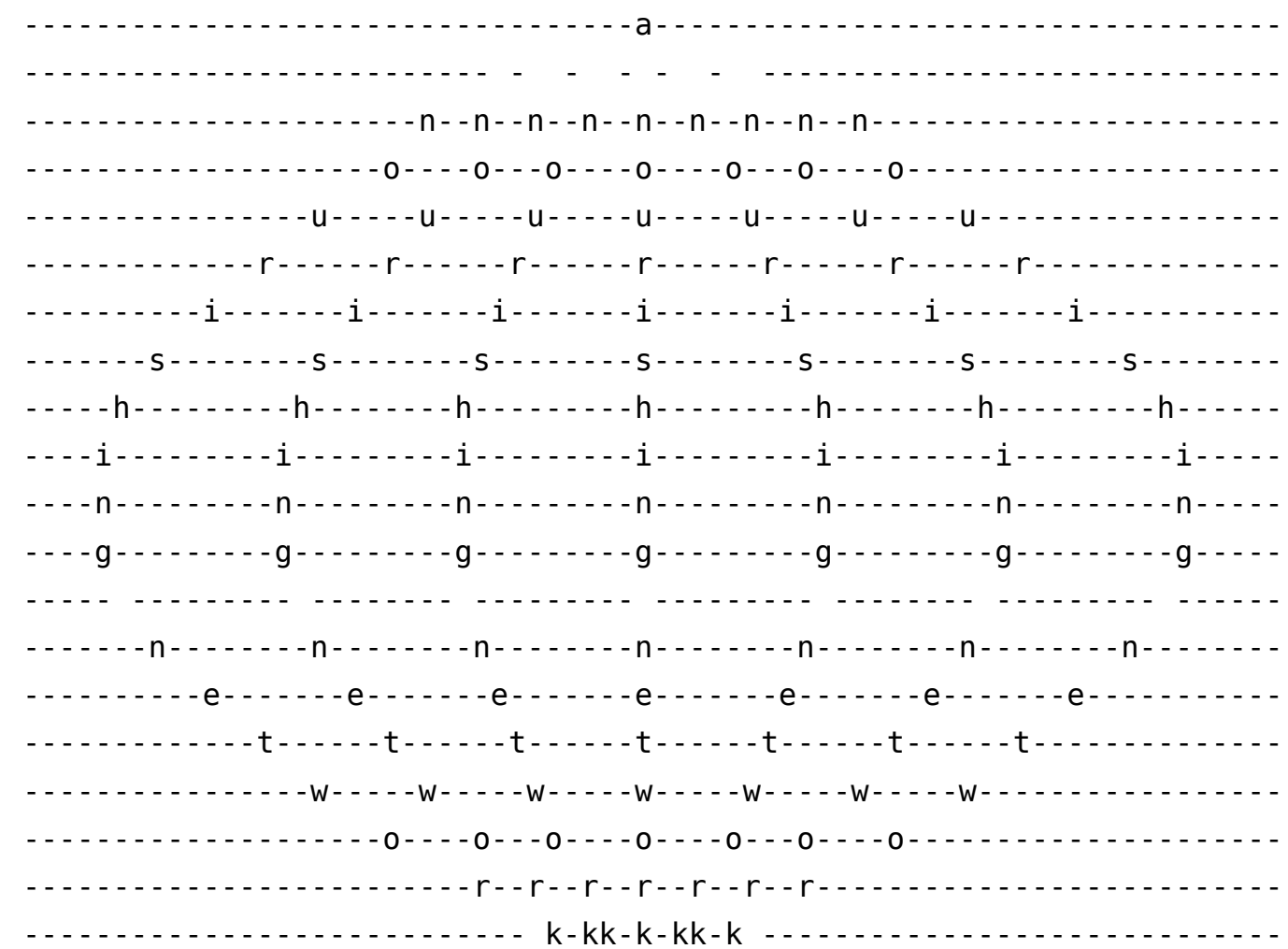
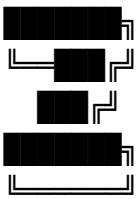
A Nourishing Network

Zugzwang or the Compulsion to Find a Common Baseline in Sound

by Christina Gruber, Natalia Domínguez Rangel, Samuel Hertz and Emil Flatø



Zugzwang: German for “compulsion to move”, is a situation found in chess and other turn-based games wherein one player is put at a disadvantage because they must make a move when they would prefer to pass and not move (Oxford Dictionary)



ugzwang explores how a more-than-human approach towards the use of technology can help us to tune in with our companion species and environments, understanding them as assemblages - open-ended gatherings of living and non-living ways of beings.[1] We aim at observing the role of sound as a critical player in re-connecting with our environments and to engage in relations of care on both ends to help us navigate on earth's surface. Key themes came up in online discussions our multidisciplinary group had during the first lockdowns due to the outbreak of COVID-19, in preparation of a joint panel for the festival Art Meets Radical Openness in May 2020.

What could a common baseline sound like?

The attempt to tune-in with our environments opens possibilities to critically discuss questions of listening, talking, and connecting with all our companions, living and non-living. While the act of listening opens particular possibilities for care, it is not an inherently benign action: both nonhumans and humans (including the military[2]) use their auditory capacities to eavesdrop on other species[3]. Sound is omnipresent, but unfamiliar as a way for the world to present itself: We have problems understanding. Miscommunication and distortion happen constantly. Can listening become once again one of the main assets to learn about our environment? The access to vast archives of data allow the interpretation of planetary sounds using machine learning[4]. But will this prevent further misunderstandings? How can humans actively teach these systems to avoid a too strong human-perspective and enable them to think as a connected network resonating on Earth? Zugzwang is local and global, and so are our five short explorations into forms of noticing, following the characteristics of sound, how they can be received, propagated, and perceived.

The Fictions of Iconic Earth Images, and the Possibilities of Sound – Emil Flatø

Suddenly, silence. Silence in the microphones of acoustic ecologists. No bewildering noise from the whirl of the bottom trawler and its massive engine, no buzz of chainsaw along the rainforest's perimeter[5]. The ambient sounds of traffic reduced to a minimum. In March 2020, a nonhuman precision-weapon, the SARS-CoV-2 virus, had put a pause to human enterprises – and a muffle to its sounds.

Recordings of this sudden silence made a strange impression on many commentators. Paradoxically, it was as if the amplitude of human clamor became sonorous only when it could be played back as an absence. Why is it that our daily interruptions in ecological life hardly register – the confusion our chatter must introduce to the tapestry of bird calls that crisscross public places, the inescapability of boats in trading-route rivers – while sudden encounters with worlds without us fill us with awe?

Or perhaps more curiously than awe, these impressions of human impact through their absence have a history of instilling a sense of custodianship on the beholder[6].

The emergence of environmental consciousness was far more conditioned by images than sounds. The undisputed icon of modern environmental awareness is a photographical genre that only became possible through the Cold War space race: Images of earth from space[7]. The 1972 Blue Marble image, captured by one of the astronauts aboard Apollo 17, is one of the world's most reproduced images. Its impact on culture is intimately tied to environmental consciousness: While the image only became possible as humans learned to leave the planet on which all of their history had played out, the intellectual revolution had to do with looking back to see the only planet we have. The moral implication was clear: Take good care of it[8].

The fiction of human agency involved becomes clear if we take the visual trope that expresses this point seriously: The hand holding Earth in its hands. It is a surrealist image, in literal terms. It casts us all in the role as an individual giant, large enough to hold the world up like a precious basketball.

Only despots believe in that fiction[9]. (An image of President Abdel Fattah el-Sisi of Egypt, King Salman of Saudi Arabia and former President of the United States Donald Trump should pop up on your inner eye.)

In reality, the Blue Marble, like the recordings of silent environments post Covid-19, depicted a world we inhabit, but where we do not figure; high-resolution satellite imagery is a newer development[10].

But the specific way our cosmological and ethical imaginations are conditioned, matters. The propensities of sound are different from those of photography. Listening to our momentary lull, we should not merely ask about what we don't hear – us – but what it means to hear environments, and how our consciousness of our surroundings may change if we consider the matter in auditory terms. Perhaps for no other reason than the primacy of visual thinking in environmental thought; that there is a relative paucity of iconic sounds, of chewed sonic metaphors, of heavily preconceived auditory templates, brought down upon us from Western traditions of science and representation, with which to think what is around us.

This time, perhaps we can hear ourselves for what we are, rather than seeing us for what we are not: Omnipotent, larger-than-Earth beings with the planet in our custody.

Is there care on both ends? Re-establishing bonds with our companion species - Christina Gruber

As a freshwater ecologist and visual artist I work with fish on a daily basis. In the last few years, I have been focusing on one specific kind, the sturgeon. This living fossil has been on earth for over 200 million years, adapting to constant changes and overcoming crises. Throughout the last 150 years sturgeon populations decreased drastically due to human overexploitation. In the conservation project LIFE Sterlet[11], we aim to strengthen the wild stock of sterlet, the smallest of the six Danube sturgeons, to establish healthy and self-sustaining populations in the Danube river. We are located on an artificial island built for flood protection for the city of Vienna, Austria.

Do we only listen to what we want to hear?

The loss of freshwater biodiversity happens most of the time unnoticed, in silence. However, the decline of freshwater species exceeds most other terrestrial ecosystems by a wide margin[12]: Between 1970 and 2014, freshwater fish populations have declined by 83%.[13] Sturgeons communicate on infrasound levels, inaudible to human ears. Stil, there are sources from indigenous communities, such as the Menominee Tribe of Wisconsin, referring to the phenomenon of “sturgeon thunder”, drumming sounds produced during spawning season.[14]

My work routine adjusts to the life cycle of the sturgeons. After months of care in our hatchery, we release thousands of fish into the Danube. Observing their development from eggs, to larvae, to juveniles, does not only mean that we are providing care in a very basic sense of the term[15]. It also requires serious attention, to treat them correctly, and to avoid damage or risk[16].

Even though sturgeons have been around for millions of years, we know little about their habitats. This is why we monitor them along the river to point out recommendations for their protection. One of the most effective ways to follow a fish is sound, as the waves travel faster underwater. In Acoustic Telemetry, hydrophones are used to track the fish, but not to record their noises. All you actually hear is “beep”. But what if hydrophones allow us to enter into the muddy reflections of the past and this dinosaur’s life cycles, and even more so help us to reconnect to this hidden layer of our earth’s surface? Working closely with sturgeons made me wonder

how they perceive sound, and what they sound like. Do they communicate to each other, are they gregarious or solitary? Can I hear them too? To hear like a fish, means to hear with the entire body, based on the main organ of orientation in fish, the lateral line. Attention to fish perceptions, then, may attune us to our own unexplored capacities for sensing the world, like the fascia, a thin casing of connective tissue that holds everything in place but also enables intensified sensing[17]. In addition to our own sensory organs, technology can help us to detect sounds out of human hearing range, acting as a stepping stone to help us recalibrate with more-than-human entities.

Trying to hear my companion species made me realize how much I need the sturgeons and how much work they do for me. What if more people could hear these living dinosaurs? It could make us realize the close ties between sturgeons and healthy ecosystems, including humans, and that it is possible to tune in and give space to them. And we might start to understand that it is not we who are thinking, but rather the environment that is thinking through us, as David Abraham[18] proposes.

Connecting Acoustic Spaces - Natalia Domínguez Rangel

My work connects with architecture, acoustics, technology and nature. I am responsive to how sound affects and resonates with a body physiologically and psychologically, and how critical listening deepens, extends and sets connections to other acoustic ecologies not only to the anthrophony[19].

During the first lockdown due to COVID-19, I invited people to send me audio recordings of their acoustic environments. The call is open till the end of the year due to the ongoing pandemic. “Connecting Acoustic Spaces” will be the resulting work becoming a sound sculpture in 2021.

I am involved in the way we are listening and interpreting our surroundings, especially in this time where we are experiencing a global pandemic, partial lockdowns in different time frames, intensities and outcomes. Throughout the first lockdown, our urban acoustic environment changed radically. It has not only impacted our cities but also diverse scientific research. For instance, in seismology the drop of the human noise footprint was between 20% and 50% and that has helped to easily spot micro-earthquakes. This “silence wave” helped to record and archive tremor fingerprints that were not audible previously. I find it very relevant how, gradually, our noise footprint increases and how unaware we were (are?) of the huge impact it has.

This has brought me to reflect on: How do we imagine ourselves as listening objects, bodies? The need to understand our own acoustic agency and how it tunes in or makes sense with our and other sonic environments.

For which reason are we listening? Deep listening does not outstand the ear alone, as Pauline Oliveros remarked in her work. For her, listening involved the whole body. “Sound has such a physical presence that it feels like it is coming at you through the pores of your skin; You listen through your lungs. You listen through your stomach. You listen through your heart.”[20]] Then you come to understand that you also listen to your body. You are your own acoustic box.

And what about silence?

Are urban sound ecologies destroying silence as many Acoustic Ecologists claim? “Their ecological approach appears to treat silence as an endangered species; something that must be preserved by maintaining habitats for its incubation and growth”[21]

Yet again, I do not think we can romanticize the idea of an aural utopia by misjudging the nature of city sounds. Technology is present and mediates the space. Therefore, how could we tune in again with different ecologies with the help of technology?

When we acknowledge the idea of “tuning in,” shall we imply the act of acoustic attenuation? Or to think about “silent commons”, as Ursula Franklin called them within the city[22]. The impact of technology creates new opportunities and hazards in this topic. Thus, how could we keep advancing technologically without being a solo act?

With “Connecting Acoustic Spaces”, I am still in the process of listening. In the following link you can listen to what I recorded in my listening practices throughout the first lockdown in Vienna from the 15th March till the 10thMay in the most frequented and touristic places. https://soundcloud.com/nataliad/viennese-acoustic-transition

Spotting the Runoff – Samuel Hertz

“We in the morning / catch, from the train, in the green garbage runoff, / sight of white herons and the cormorants. / When they’re here in the evening, we safely assume the world hasn’t gone anywhere.”[23]

Even though the herons and cormorants remain in site, the world has gone somewhere, however imperceptibly. Ed Roberson’s “Eclogue” points to the gnomonic shadows highlighting empty space as a way of measuring time. Yet, the chronological safety implied by regular migration patterns belies the severity and scales of disappearance that happen just beyond view, out of sight and earshot. Attenuation to the patterning of bird migration, in this case, is just enough of a false positive to overlook the garbage runoff, or to believe anything can truly repeat. If patterned vision upholds this homeostatic narrative, perhaps sound can be understood as a method for delving into the infinitesimal — yet significant and cumulative — dimensions of change.

How then to make audible the sounds of disappearance? To hear absence? The analytic lens of machinic audio analysis is — in recent years — the most reliable format for reporting subtle shifts in acoustic environments caused by environmental stressors, due to the ability to capture large sonic datasets required for detailed comparisons. What these analytic frameworks lack, however, is the ability to encourage nuanced understandings of expansive temporal and spatial scales necessary for tackling the conceptual and practical problems of a changing climate. For, as Hawkins and Kanngieser eloquently state, “relative to human perceptive capacities, factors [of climate change] accumulate too slowly for the scales and capacities of a human-sensing body in the context of the human lifespan to fully comprehend”.[24] Application of effective climate policy involves not only analytic/algorithmic frameworks, but attendant feelings of care and responsibility towards. To develop care for bundles of entangled dynamic flows that are innately asynchronous with the spatiotemporal scales of the lived-life of humans, new scalar sensitivities must coincide with any algorithmic approach.

Can sound-based performative methodologies encourage modalities of listening that allow for the hearing of shadows? To observe ever-more carefully, and importantly to address the creeping disappearance that lays contiguous to a human-world of ostensible homeostatic repetition? With two recent projects, Zugzwang with collaborator Christina Gruber (Ars Electronica Festival 2020), and DOOM with collaborator Layton Lachman (premiere, Sophiensæle 2021), I address dynamic interactions between sound, experiences of time, and the possibilities for analysis and practice to generate new scalar sensitivities.

Zugzwang (in this particular format) turns the process of environmental analysis inside-out, granting the human ear access to recordings normally reserved for machine processing. As the listener walks through the installation, field-recordings of soil sedimentation stream past, letting the listener organise themselves within an immersive experience of data becoming sensually available. In DOOM, an audience finds themselves in the middle of an eternal, slowly-evolving drone/doom-metal concert wherein various spatiotemporal scales become activated; four performers drift through the space, performing glacial guitar solos, quickly putting on their makeup, and singing to each other — actions which coalesce into many variable experiences of time through which one can feel the space, action, and attention slowly shift throughout the durational performance.

My hope is that performative experiences such as these can help encourage and nurture new relationships to the passing of time and experiences of data that will further aid in the understanding of — and responsibility for — the unique and intertwined scalar problems of climate.

Being in Zugzwang

As humans increasingly move their environs, building capitalist ruins[25], the compulsion to move in ways that are ethical, life-sustaining and even life-affirming for the more-than-human community becomes a moral imperative as much as a practical necessity. Our four explorations of how to tune in through auditory capacities – human, animal and technological – may work as a bit of a field guide, suggestions for how to orient ourselves better and more conscientiously. Soundscapes, even the silence under lockdown, turn out to be dense with life and meaning. Whether we hear them with our whole bodies, listen with deep attention or stretch beyond the scales and realities humans can perceive without technological aid, it seems there is a productive friction in sound, which positions us more firmly and compels to move in different ways than other media and forms of sensation.

It helps us reorient around an important meaning of environments: Our surroundings. Sound conveys a world in Zugzwang.

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1. Anna Lowenhaupt Tsing, The Mushroom at the End of the World. On the Possibility of Life in Capitalist Ruins. Princeton University Press, 2015. p.23.

2. The US and the UK jointly run a center dedicated to electronic eavesdropping in Menwith Hill, Yorkshire. Ryan Gallagher, “Inside Menwith Hill: The NSA’s British Base at the Heart of U.S. Targeted Killing,” The Intercept, September 6, 2016.https://theintercept.com/2016/09/06/nsa-menwith-hill-targeted-killing-surveillance/

3. Intra- and interspecies eavesdropping is a well-established phenomenon in ecology. To cite just one study, it has been found that male humpback whales listen for the mating songs of competing mates to locate a female, reducing the singer’s chance of success, Rebecca A. Dunlop & Michael J. Noad, “The ‘risky’ business of singing: tactical use of song during joining by male humpback whales,” Behavioral Ecology and Sociobiology 70 (2016), 2149–2160.

4. Brian Dunbar, “Spooky Space ‘Sounds’”, NASA.gov, National Aeronatics and Space Administration, October 26, 2017 https://www.nasa.gov/vision/universe/features/halloween_sounds.html.

5. A curious facet of the lockdown as a media event, was the blossoming of writings about ways silence was being recorded and related to in cities and ecosystems. Jimmy Thomson, "'An important time to listen': ocean scientists race to hear the effects of coronavirus under water," The Narwhal, April 19, 2020. https://thenarwhal.ca/an-important-time-to-listen-ocean-scientists-race-to-hear-coronavirus-under-water/?fbclid=IwAR1g9p1JWSqniQKHeJ6PodtEOLkd1SpSc6hkbOFaGodmzU3Qromah_Nl5Nc; Richard Labreuseur, "How COVID-19 shutdowns are allowing us to hear more of nature", The Conversation, May 5th, 2020, https://theconversation.com/how-covid-19-shutdowns-are-allowing-us-to-hear-more-of-nature-136139; Quoctrong Bui and Emily Badger, "The Coronavirus Quieted City Noise. Listen to What's Left," The New York Times, May 22nd, 2020 https://www.nytimes.com/interactive/2020/05/22/upshot/coronavirus-quiet-city-noise.html

6. Benjamin Lazier, "Earthrise; or, The Globalization of the World Picture", The American Historical Review 116, Issue 3 (2011): 602–630.

7. Dennis Cosgrove, Apollo's Eye: a cartographic genealogy of the Earth in the Western Imagination (Baltimore: Johns Hopkins University Press, 2001).

8. See the section on Hans Blumenberg's reading of the image in Lazier, "Earthrise", 619-626. This custodial reading is by no means the only interpretation that was made at the time – Martin Heidegger thought of the Blue Marble's predecessor, a disorienting, black-and-white view of the earth from below, as the nightmarish realization of the conquest of the world as picture", ibid., 609-614; Martin Heidegger, "The Age of World Picture," in The Question Concerning Technology and Other Essays (New York: Harper and Row, 1977) 115-54. However, through the 1970s environmental movement, Earth Systems Science and Global Environmental Governance, the custodial idea became more prevalent.

9. In his fourth Gaia lecture on "The Anthropocene and the destruction of (the image of) the Globe", Bruno Latour makes a strong case against thinking climates at the global scale, Facing Gaia: Eight Lectures on the New Climatic Regime (Cambridge (UK): Polity Press, 2017). I don't endorse his particular argument, but it is worth reading.

10. For a primer on different resolutions in contemporary satellite imagery, see National Environmental Satellite Data and Information Service (NESDIS), "Can Satellites See You? Can You See a Satellite?", NESDIS Newsblog, November 27, 2017, https://www.nesdis.noaa.gov/content/can-satellites-see-you-can-you-see-satellite.

11. http://life-sterlet.boku.ac.at/

12. Sala, O.E. et al. (2000). Global biodiversity scenarios for the year 2100. Science 287, 1770-1774.

13. www.livingplanetindex.org. 2019

14. Bocast, C., Bruch R.M., Koenigs R.P., Sound production of spawning lake sturgeon (Acipenser fulvescens Rafinesque, 1817) in the Lake Winnebago watershed, Wisconsin, USA. Applied Ichthyology 2014, 1-9. See also WLUK-TV FOX 11, "Sounds of the sturgeon", YouTube. https://www.youtube.com/watch?v=rEUuIL5Nmr8&ab_channel=WLUK-TVFOX11.

15. Definition of care: The provision of what is necessary for the health, welfare, maintenance, and protection of someone or something (Oxford Dictionary).

16. Second definition of care according to the Oxford Dictionary.

17. Referring to the Case Study of Margarida Mendes "Environmental Sensing - Refractions of the Infrastructural Body, presented in October 2020 at the Shape of a Practice at HKW, Berlin.

18. Abram, David. The Spell of the Sensuous: Perception and Language in a More-Than-Human World. Pantheon Books, 1996.

19. Anthropophony, consisting of the Greek prefix, anthropo, meaning human, and the suffix, phon, meaning sound is a neologism used to describe all sound produced by humans, whether coherent, such as music, theatre, and language, or incoherent and chaotic such as random signals generated primarily by electromechanical means. Bernie Krause "Voices of the Wild: Animal Songs, Human Din, and the Call to Save Natural Soundscapes" 2015, Yale University Press

20. Mark Swed. "How gay feminist composer Pauline Oliveros taught us to hear with more than ears," Los Angeles Times, August 5th, 2020. <www.latimes.com/entertainment-arts/story/2020-08-05/how-to-listen-pauline-oliveros-deep-listening-composer>.

21. Arkette Sophie, 2004, Sounds like City. In: Theory, Culture & Society 21, p.166

22. Ursula Franklin. "Silence and the Notion of the Commons," In The Broadview Anthology of Expository Prose, Laura Buzzard et al. (eds.) (Ontario: Broadview Press, 2016) : 439-444.

23. Roberson, Ed. "Eclogue". https://www.poetryfoundation.org/poems/89465/eclogue-573e30b04c753

24. Hawkins, Harriet and Anja Kanngieser. "Artful climate change communication: overcoming abstractions, insensibilities, and distances". WIREs Climate Change. Vol. 8, September/October 2017. Wiley Periodicals.

25. This corresponds roughly to the situation Anna Tsing refers to as "third nature", The Mushroom at the End of the World, viii. See also Tsing et al. (eds.) Arts of Living on a Damaged Planet (Minneapolis: University of Minnesota Press, 2017).

Christina Gruber is an artist and freshwater ecologist, who works at the intersection of art and science. In her work she deals with societal phenomena and their effects on the earth's surface. Water is of special interest to her. Christina sees it as the element all things on earth have in common. It is the connector between stories of different places and layers, running through everything, from clouds to data centers. She has recently exhibited at the KEX Vienna, Kunstforum Warsaw, Kulturtankstelle Linz and the Chronus Art Center Shanghai. She has given lecture performances and talks at museums, festivals and conferences like CAC New Orleans, FHNW HGK Basel, STWST48x5, River Science Conference and AMRO festival. Christina is a Scientific Researcher at the Institute of Hydrobiology at the BOKU Vienna. She works at the LIFE Sterlet project to repopulate sturgeon in the Danube. In 2019 she was part of the servus.at Research Lab together with Antonio Zingaro and Davide Bevilacqua.
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Natalia Domínguez Rangel (NL/CO) composer/sound artist living and working between Vienna and Amsterdam. Domínguez Rangel's music and sound work offers a varied mix of contemporary classical composition alongside electronics, synthesis, field recordings, ambisonics, installations and performance. Her work has been connected with architecture, acoustic, technology and nature. She is interested how sound affects and resonates with a body physiologically and psychologically, and how critical listening deepens, extends and set connections to other acoustic ecologies not only to the anthrophony. For her, sound can be a source of both pain and pleasure.
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Samuel Hertz is a Berlin-based composer and researcher investigating connections between sound and climate, emphasising geologic, ecologic, and social listening practices at more-than-human scales. As the first winner of the DARE Prize for Radical Interdisciplinarity, he researched Infrasound alongside climate scientists, music psychologists, and paranormal investigators, with a premiere at Opera North (UK). Current work includes Librations (with Carmelo Pampillonio), utilising Earth-Moon-Earth 16-26m radio telescope relays to create Moonbounce recordings. Librations premiered at Fylkingen (SE) in 2020.
As a researcher, Hertz has been involved with HKW's Anthropocene Curriculum since 2016 and is the author of six essays on sound and environment, including collaborations with Studio Tomás Saraceno, Sonic Field and Critical Path. Hertz has taught workshops on sound at Palais de Tokyo as well as at arts and academic institutions throughout Europe and the United States. Hertz has created live and immersive sound design for performance in such places as ImPulsTanz, Tanzplattform Deutschland, ICI/CCN, Charleroi Danses, and NEXT Festival.
samhertzsound.com

Emil Flatø is a doctoral researcher working on the origins of scientific thinking about the future of climate change with human causes. This means reading a lot of faxes and machine-typed reports written by men with sideburns and thick glasses in the early 1970s: experts in "socio-technical engineering", "system dynamics", communications, planning and computer modeling. These men spoke with newfound confidence about the future of the Earth, the limits to growth, and the dangers of playing with the weather. They pioneered new alliances between military, government, industry and the academy. In sum, they did lasting work on our collective horizon of expectations about the environment. Previously, Flatø worked a staff writer and critic for the Norwegian weekly Morgenbladet.