

## **Animas: Disaster, Data, and the Resonance of a River**

Brian House

My boot splashed in the shallow water and stuck. Thick, orange sediment swirled around it – iron oxide runoff from a cut somewhere nearby, some industrial monument nestled deep in the Colorado Mountains. This geography was familiar to me from my youth, and my partner and I had returned to the area as artists-in-residence at the Rocky Mountain Biological Laboratory. We were hiking with Dr. Heidi Steltzer, a biologist from Fort Lewis College in nearby Durango. “It’s the color of the Animas River,” she said, looking at the water.



Hiking in Gothic, Colorado (Brian House)

As Heraclitus famously put it, “You can’t step into the same river twice,” and a river is a perfect example of a thing that is not a *thing*. It is, rather, “vibratory, liquid, and virtual,” which for Jane Bennett are animate qualities (2010: 29). In this respect, the Animas River is well-named. It is animated, too, by the paradoxical vitality of the metals which it carries – as Mel Chen has discussed, what is animate need not be biological, and it might even, as in this case, be harmful to biological life (2012). Animacy, rather, is the material capacity to affect and be affected, and to understand the river in this way is to consider both the geologic forces and the human histories through which it continues to modulate the Coloradan environment.

Precipitated by Steltzer’s observation, such ideas flowed into my material investigations of sound, metal, and data, eventually arriving at an artwork commissioned by the University of Denver. In this text I describe the background of this piece in terms of the past and present of the river, the art-historical context in which the artwork is situated, and the conditions through which I produced it. I proceed with the hypothesis that sounding



Gold King Mine, Colorado (Denver Public Library, Western History Photographic Collections, used with permission)

materials can meaningfully engage the complex interrelationships that constitute our environment, interrelationships that overflow more typical visual representations in which nature and culture are clearly distinguished.

The river's name is not of materialist origin – Río de las Ánimas ("River of Souls") was the invention of the Spanish explorer Juan María de Rivera, who attached it to the river known to the Ute people as Sagwavanukwiti (which translates, ironically, as "Blue River") (Thompson 2018: 17). In 1765 he made an unwelcome incursion into what would later become Colorado, noting the presence of gold in the region. The waves of European and Euro-American invasion that followed displaced the Ute people, and in the so-called Brunot Agreement of 1873, the United States government officially opened the San Juan Mountains to unrestricted mining (Wildfang 2009: 27). Today's Southern Ute Indian Reservation sits on

the southern border of Colorado through which the lower Animas flows – the river then joins the larger San Juan before entering the lands of the Navajo Nation. Both reservations are therefore affected by what is released into the Animas upstream in the prior Ute homelands.

Along a tributary of the river in these mountains sits the Gold King Mine. This particular mine was active in the last days of Colorado’s gold mining boom and produced upwards of 350,000 ounces of high-grade gold, worth nearly half a billion dollars at today’s prices (Turkewitz 2015). Abandoned in 1923, it is now one of ~23,000 inactive mines dotting the landscape. Every spring, melting snowpack finds its way into the tunnels, and a subsequent chemical reaction with the exposed sulfides creates what is known as “acid mine drainage.” This process also dissolves heavy metals – now sans gold – into the water, creating a toxic mix (Beaty 2016).

The Animas is incredibly picturesque, and the local economy relies heavily on tourism, white-water rafting in particular. However, the liveliness of the river belies the absence of species such as trout, a signature presence in most Colorado waterways, which disappeared from the upper river shortly after mining first began in the region and have not returned since (Thompson 2016). This is because the mines leak. Over the century leading up to 2015, for example, up to 200 gallons per minute of acid mine drainage flowed out of the Gold King. Sealing it up proved to be a game of whack-a-mole: for every bulkhead installed, increased pressure caused another leak elsewhere (Thompson 2016). A full-fledged cleanup would have required a federal Superfund designation, but local municipalities rejected this option for fear of the associated stigma and its effect on the tourist industry (Langlois 2015). It is a telling irony that an attachment to the *perception* of the region as a pristine wilderness – a value rooted in Romantic representations of nature – in this case impeded actual ecological remediation.

In the summer of 2015, water escaping from the mine suddenly decreased, which prompted a visit by contractors for the Environmental Protection Agency (EPA). The concern was that pressure might be building up inside, and the plan was to open a controlled flow from one of the plugged entrances to release it. The contractors certainly succeeded in releasing pressure – three million gallons’ worth of contaminated water escaped through the exploratory hole they had made.

<https://www.youtube.com/watch?v=ZBIR05tDCbI>

The water washed out the access road, and the crew was forced to leave and let it flow uncontrolled into the Animas watershed (Thompson 2018: 4). Carrying high concentrations of iron oxides, cadmium, arsenic, copper, manganese, lead, beryllium, aluminum, and zinc,



The Animas River in 2015 (Mor Namaan, used with permission)

the spill caused over \$1.2 billion in economic losses, while the ecological impact is unquantifiable. The area's indigenous peoples have borne the brunt of both, with an estimated \$335 million in uncompensated damages to Navajo Nation crops alone (McCain 2016).

Before and after photos gave the river its media moment, with green pines providing the perfect contrast to the water that had become, thanks to the iron oxide, bright orange. Artists' responses have capitalized on this apparent distinction between untouched nature and the wreckage caused by human industry. A notable example is a show mounted a year after the spill by the Yerba Buena Center for the Arts in San Francisco: *Golden Prospects* by photographer and videographer Kevin Cooley. This work shows the unexpectedly beautiful new color combinations of the altered landscape on monitors throughout the exhibition space, occasionally featuring the artist's friends going through the motions of panning for gold. According to Cooley's [website](#), the installation "points to the difficulties of distinguishing between what is natural and what is caused by human interference, asking us to question whether, and how, to trust the elements that nurture and sustain us." And yet in

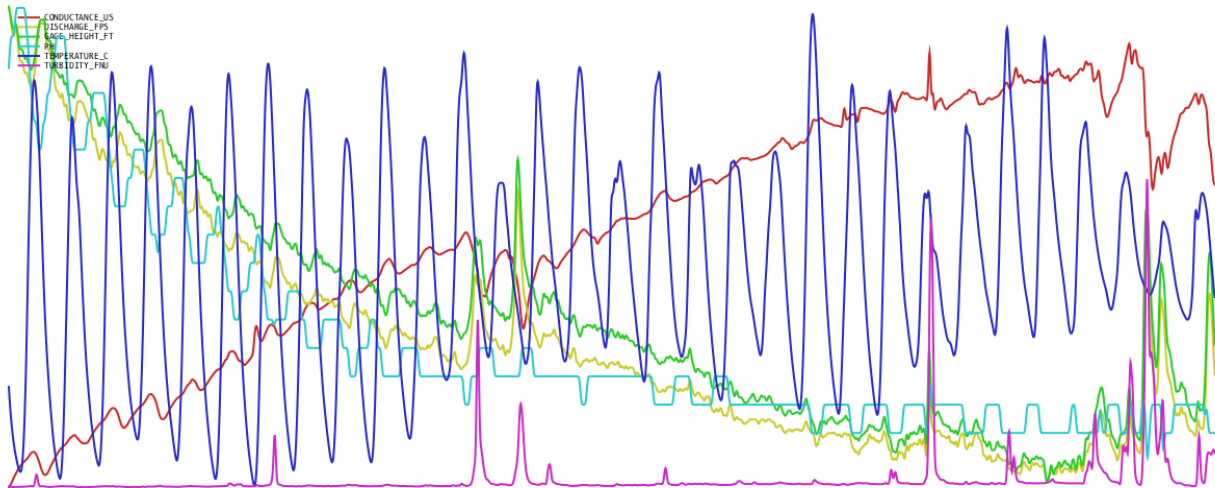


Kirk Lashmett of the SUIT Water Quality Program inspecting a sonde (SUIT Water Quality Program, used with permission)

its meticulously framed and glowing imagery, the work establishes color as the index of precisely such a divide.

However, the mesh of interrelations that is the Animas cannot be traced in orange. In 2016, Steltzer published an op-ed in the Durango Herald that warned readers, "Don't judge a river by its color." In the article, she explains that a visible color indicates the presence of undissolved metals, which are less harmful than those that are dissolved and invisible. The danger is twofold, as a clear river is more unlikely to deter use of the water when its true makeup is unknown. Furthermore, a fixation on color also suggests that the Gold King Mine spill is an isolated disaster rather than an indicator of the river's continually changing composition.

The reality, however, has long been understood by Southern Ute Indian Tribe (SUIT) and Navajo Nation scientists. The [SUIT Water Quality Program](#), for example, already had multiple "sondes" in place prior to the spill due to the importance of the Animas for tribal agriculture and drinking water. These bundles of sensors measure various unseen indicators of water quality. After the event, several organizations placed sondes in the river, including ones in Durango, Silverton, and in Cement Creek near the Gold King placed by the United



One month of USGS data “streams” from the Animas River (Brian House)

States Geological Survey (USGS), and Steltzer’s sonde at Fort Lewis College. However, the SUIIT possesses the only data of the spill itself from the Animas in Colorado (Sullivan 2017: 20). This underscores how communities that cannot trust public agencies to act on their behalf have had to develop their own capacities to gather essential data. Further, these data are a means of asserting the presence of indigenous people who are neither culpable for degrading the river nor do they belong to a lost, primeval nature, as stereotypical representations of the West may imply.

Thanks to Steltzer, Curtis Hartenstein of the SUIIT, and Steven Anders of the USGS, I gained access to multiple data streams, which evince a complex story. Visualizing these data over time quickly dispenses with any preconception that the flow of the river is a constant thing, or that contaminants in the Animas are decreasing linearly. The numbers produce an ensemble of periodicities, punctuations, cadences, and builds. It is strikingly rhythmic. Take, for example, conductance – an indicator of dissolved metals – which stair-steps in daily bursts, only to plunge erratically every so often before building up again. Looking at these graphs, I realized I had never thought of a river as being connected to diurnal cycles in this way. In fact, the very shape of the waves expresses the interactions upstream among sunlight, snowmelt, rocks, roots, animals, and humans across multiple temporalities.

In this respect, the river is an excellent example of an assemblage, as Bennett describes it, an “ad hoc grouping” of materials that together possess “emergent properties, emergent in that their ability to make something happen [...] is distinct from the sum of the vital force of each materiality considered alone” (2010: 24). The river, as an assemblage, is *animated* by its interconnections, and it likewise *animates* those materials – in this case

most notably metals – as it moves downstream. From this standpoint, the Gold King Mine spill cannot be understood as a singular event nor captured in a static image. Rather, it is a conflux of historical processes – a double irruption into the present of both the deep time of geologic forces that deposited the minerals and the historical time of resource exploitation in Colorado. The dynamics of the water that emerge are inextricable from these pasts even as they encounter present political realities – the economics of tourism and agriculture, indigenous rights, data politics, and short-sighted government bureaucracy – and exemplify the difficulty of representing such complex flows.

There is no etymological relationship between the terms “sonde” and “sound.” Yet the resemblance between the two is provocative and not only superficial. As Christoph Cox writes, sound art is not about what something “means or represents, but what it does, how it operates, what changes it effectuates” (2011: 157). Or, as Brandon LaBelle puts it, “Sound is intrinsically and unignorably relational: it emanates, propagates, communicates, vibrates, and agitates [...] it sends the body moving” (2015: ix). LaBelle might as well have been describing the animating force of water. This implies that sound art affords relating on an embodied level to what is lively, temporal, and contingent in the river’s flow. As Caleb Kelly has pointed out in a [previous issue of this journal](#), however, Western artists and theorists frequently abstract “sound in itself” from the materiality through which it is produced and perceived. But the cultural and political resonances of these materials are part of what makes sound relational.

Along these lines, I am particularly interested in the artistic use of transduction. Transduction names the material transformation of one form of energy into another. When it comes to sound, this might be as simple as a stick struck against a surface, as even this simple act moves a vibration from hand to wood to air to ear to nerve that implicate hearing in a chain of material contact. Jonathan Sterne points out that all technologies of sound (re)production are inevitably “transducers” – culturally produced means of turning sound into something else, or that something else back into sound (2003: 22). We intuitively understand something about how transducers work when we put on a record. Rather than taking the result to be a representation, we move along to a beat that is as real as when it was recorded. Stefan Helmreich warns, however, that we should listen closely for “telltale distortions and resistances, turbulence that might reveal the conditions beneath any self-evident ‘presence,’” and he asserts that doing so is a way of thinking through both the material and the meaning of our vibrating world (2015: 225).

Sound art has long taken these contingencies of transduction to be an artistic strategy. David Tudor's *Rainforest IV* (and *V*), from 1973, is an early touchstone. Tudor calls on participants to build a series of sculptures from resonant physical materials and suspend them from the ceiling. To each of the sculptures is affixed an "audio transducer" – a type of transducer that transforms an electrical audio signal into vibrations in much the same way as a speaker, but which vibrates solid objects rather than air. Each participant subsequently "programs" their sculpture with audio "collected from natural scientific sources [that] are specific to each instrument, exciting their unique resonant characteristics." Playing audio "through" the sculptures quite literally animates them as they audibly vibrate in place, inflecting the pre-recorded sound with their own unique distortions.

Such liveliness in *Rainforest* suggests a comparison to what the critic Michael Fried called "presence" in the work of minimalist sculptors such as Alice Aycock, Donald Judd, and Richard Serra. He famously derided this quality as something more appropriate to theater. According to Fried, the problem is that presence is inherently durational – it is animated over time – whereas "presentness" is a sublime quality in which at "every moment the work itself is wholly manifest" (1967).<sup>1</sup> Given this, the sound produced by transducing materials only more explicitly realizes the temporal relationship to the viewer that is central to the minimalists' silent work (likely making it even less palatable to Fried).

Sound art such as *Tabla Room* (1999) from Bernhard Leitner makes the connection even more explicit, with a series of austere steel panels hung from the ceiling that are reminiscent of Richard Serra's sculptures. Like *Rainforest*, these are resonated by transducers – this time just bare speakers magnetically attached to the metal – and they invite a peripatetic interaction. The size and position of the panels, not to mention the complex harmonics with which they vibrate, make listening a matter of more than just the ear. Leitner once claimed, "I can hear with my knee better than with my calves" (Leitner 2008), which testifies to the intent of the work to not only create a relational presence in the room but to activate it as a sensation within the human body.

Leitner's work may successfully involve the listener on an embodied level, but in its fixation on the phenomenological experience of "sound in itself," it ignores other forms of relation. This exemplifies how sound art, according to Seth Kim-Cohen, often feels "no obligation to point to the world" (2009: 41). In contrast, Kim-Cohen argues that minimalist sculpture – and visual art in general – has been able to progress from focusing on presence

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<sup>1</sup> Interestingly, this same dichotomy of terms is used by the philosopher and sociologist Henri Lefebvre, for whom what is "present" is a commodifiable stand-in for the material "presence" of continually evolving – and political – relationships (1992: 22-23).





Installation view, "Robert Smithson, *Mirror/Salt Works*," 1976 (The Renaissance Society at the University of Chicago, used with permission)

to participating in a discourse of meaning. One way to engage beyond the gallery while retaining the special affordances of sound is to pay closer attention the how the sounding materials themselves are situated.

Consider the work of Robert Smithson, who is known for working in both the art gallery and in the landscape. He referred to these as "non-site" and "site," respectively. Smithson's "site" work includes such monuments as *Spiral Jetty* (1970), which foregrounds the process of entropy in the relationship between a human-made construction and the Great Salt Lake. His "non-site" pieces, however, bring raw materials – dirt, stones, and industrial detritus – indoors. These "three-dimensional pictures" produced for Smithson a "'new sense of metaphor' free of natural or realistic expressive content" (Smithson 1968). In other words, a pile of earth does not look like the landscape from which it is drawn, but it literally establishes a connection to a site beyond the gallery.

Smithson's interest in entropy already concerns his work with the agency of matter in complex and durational relationships with human culture. Though no acoustics are involved, we might still say it "sounds," within both the deep time of geology and the time of human industrial excavation of the earth. Intervening in these processes is a form of transduction, and Smithson involves the viewer in ongoing relationships happening elsewhere, not through representation but via a material chain of contact. In this way, Smithson binds the phenomenological experience of dirt to something beyond the frame,

including the social context of art and the discursive boundaries between nature and culture within the real (and named) "site" of the piece. This attention to the source of the materials, as well as an awareness of how the gallery positions them, goes where Leitner's work does not. At the same time, it is neither formally nor phenomenologically incompatible with Leitner's approach, which suggests that both strategies might be used together – audio transduction could be a means of animating meaningful materials and emphasizing somatic sonic experience.

None of these works, however, address the contemporary use of digital data, which have their own affordances for establishing both presence and a relationship between site and non-site. One particularly relevant example of an artwork that makes use of these is David Bowen's [Tele-Present Water](#) (2011). As an installation intended for a gallery space, it is linked to a buoy floating somewhere on an unknown trajectory through the Pacific Ocean (which adds an interesting wrinkle to the concept of site-specificity). The buoy was originally deployed (and anchored) by the National Oceanic and Atmospheric Administration (NOAA) and is collecting data on the frequency and intensity of the waves in which it now drifts. It transmits data via satellite, which Bowen retrieves and scales to the movement of the installation. This physical construction consists of a grid of plastic tubing suspended in space that is flexible at its vertices, each of which is pulled up and down by a mechanical actuator mounted in the ceiling. The result, according to Bowen's [website](#), "recreates the physical movement of the surface of the water" by animating this abstracted geometry within the exhibition space.

However, while *Tele-Present Water* is directly concerned with conditions outside of the gallery, Bowen's artistic choices intentionally downplay the materiality of that relationship. The piece draws from the abstractions of cybernetics in which connection is not a matter of material transduction but of the transmission of information – Bowen's grid invokes the vectorial lines of datafied motion that are a well-established trope of digital aesthetics. Though the grid is animated as a marionette is, it ultimately expresses absence, not presence. Nonetheless, the matter of waves measured by the buoy becomes data for its electromagnetic radio, which is in turn data for the hard disks of the NOAA database, which become data for a fiber-optic network, which is, finally, data for the actuators in the gallery. Or, as Bruno Latour puts it, a datum "belongs to matter by its origin and to form by its destination," and so there is no "rupture between things and signs." (1999: 56) That is to say, digital transformations, too, are performed by transducers, and these are part of the animated matter that sounds in the piece, whether or not this fact is emphasized aesthetically.

Taken together, these pieces create a field of artistic possibilities through which to formally establish a relationship to the Animas within a gallery setting. If *Tele-Present Water* demonstrates the poetry of real-time data from a distance, *Tabla Room* explores the intimacy of material presence. *Rainforest* foregrounds the distortions of transduction as a non-neutral process, while Smithson's displacements understand extractive industries to be an entanglement of human activity and aesthetics with the deep time of geologic processes. And the obvious rhythmicity of data from the Animas, together with the difficulty of representing the Gold King Mine spill as a dynamic process, match the predispositions of sound to explore notions of flux and becoming. All of these influenced the development of my own work as I considered possible means of relating to the river.

After a series of conversations with curator Jeffery Keith and Lauren Abman, Assistant Director of the University of Denver's Vicki Myhren Gallery, I was commissioned to create a work for an exhibition titled [\*Storm Warning: Artists on Climate Change & the Environment\*](#) (March 9 – April 30th 2017). This show would allow me to realize my interest in the Animas that had been piqued after meeting Dr. Steltzer at the Rocky Mountain Biological Laboratory in Colorado the summer before, when I visited the river in person. Having the exhibition in my hometown aligned perfectly with my intention for the piece, as the state capital is geographically removed from the Animas watershed but is nonetheless a critical site vis-à-vis its politics. The timing, however, meant that I would produce the work at my studio in Pawtucket, Rhode Island, highlighting the importance of the relationship between non-site and site in the project.

My work with data has always come from a place of ambivalence – data do not exist as such, and I have been interested in ways of shifting their use into affective registers that highlight their material, performed, and culturally produced aspects.<sup>2</sup> I avoid applying the term “data sonification” to my approach, as I feel it usually denotes an exercise in symbolic abstraction that makes little of the material potential of sound. For the same reason, I've typically eschewed purely digital audio approaches in an effort to make more of that potential, through such means as working with classically trained musicians who bring an embodied and personal history of interpreting data as sounded expression. My first inclination regarding the commission was along these lines – the river would become a musical score for an ensemble. I would compress the rhythms of the Animas into a playable

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<sup>2</sup> See, for example, [https://brianhouse.net/works/quotidian\\_record/](https://brianhouse.net/works/quotidian_record/) and [https://brianhouse.net/works/oh\\_dear\\_me/](https://brianhouse.net/works/oh_dear_me/)

temporal scale, and the musicians would re-animate them in a performance that would happen in the gallery.

This idea, however, immediately raised a question. What period of time would I use? Thanks to the SUIT Water Quality Program, I had access to data from the time of the Gold King spill, which would be the most dramatic. Making music of just this event, though, felt contrary to my purpose, as it would sensationalize a particular moment rather than pay attention to the assemblage from which it arose. If I was most interested in how the river itself is always animate and how its complex pulsations work across multiple timescales, I could not take it out of its durational continuity. The data would have to be real-time, which the USGS sensors made possible. But this also made a performance by musicians less feasible, as meaningful oscillations in the river happen over longer durations than a human can physically play. Further, the conceptual role of musicians in relation to both the Animas and the gallery felt arbitrary.

Subsequently, I became focused on the metals in the Animas and if they might be resonant in extracted form. I had begun experimenting with transducing various materials during a residency at MASS MoCA, in Western Massachusetts, another post-industrial environment where metal detritus is in ready supply. There, I wired feedback circuits in which an amplifier was routed between a contact microphone and an audio transducer, both of which I would hold against whatever interesting objects I could find. A contact microphone (which is also a type of transducer) is a piezo-electric disk which picks up vibration in solid material rather than air. Sensing vibration in the same surface upon which I have pressed the transducer, and sending that same signal back into it, makes the material come alive. Unlike with *Rainforest*, or *Tabla Room*, or any of countless other examples that play some external audio source through transduced material, using feedback means the resulting sound is endogenous to the circuit itself. What become audible are the resonant frequencies of the material, in this case scrap metal, old office chairs made of steel, and various barrels. No traditional speakers were involved, but the result was quite loud, and the particular instrumental "voice" of these objects offered infinite opportunities for exploration.

<https://vimeo.com/166992042>

In keeping with these experiments, the idea of using transducer feedback with materials important to the Animas – somehow modulated with the sonde data – became the basic concept of the artwork. If water had brought an inert mineral to life, audio transduction might do the same, and the presence of these materials in the gallery would provide a



Resonant steel panel (Brian House)

literal connection to the site in Colorado. While personally extracting and refining minerals from the Animas itself was impossible, the same elements are available as industrially produced sheet metal, which incorporates a relationship to contemporary extractive industries into the piece. Of the elements overabundant in the river, some – like arsenic – were unsafe to use. But I acquired iron (in the form of oxidized steel), aluminum, copper, and lead from mills in Kentucky, Wisconsin, New York, and Texas, respectively. Inspired by Leitner, I had the panels of each metal cut to the same body-size dimensions, 42" x 36" x 1/8", and I suspended them from the ceiling at approximately chest level.

Constructing feedback loops as I had while at MASS MoCA revealed very different qualities in the sounds of the different materials, even the lead, which despite the fact that it is often used as an acoustic isolator can produce a very low frequency when freely suspended. Because the panels were the same size, the differing tones produced by each panel were entirely the result of the intrinsic properties of each metal. I recorded this feedback by including a digital audio interface in the circuit, and I edited the resulting waveform into short seamless loops. Following this, I could remove the piezo and simply play the recorded tones through the transducer, causing the panel to resonate with its intrinsic harmonics. The one parameter I could then modulate was the gain of the playback, which made each panel produce a louder or softer sound.



Audio transducer and contact microphone (Brian House)

I now had my ensemble. How data from the sondes would activate the four panels was the next question. A straightforward approach would have been to have had the level of each mineral in the water affect the corresponding panel. However, sondes do not capture this information directly – that can only be determined by taking the water back to a lab. Instead, the sondes measure a series of indicators which have an indirect relationship to the presence of specific minerals. These include the depth of the water, its rate, its temperature, its conductance, its acidity, and its turbidity (cloudiness). These six data streams sometimes change in concert and sometimes diverge. Rather than just map four of the parameters to the four panels, I opted instead to use the statistical technique of principal component analysis, or PCA, to combine all six parameters into four new dimensions with maximal variance. I found that this was an effective way to make use of all the data available and to bring out the latent dynamics with which they correlate.

I wrote this software to run on Amazon's Elastic Compute Cloud, a common platform for "data-mining" which implicates the piece in the material impact of corporate computing infrastructure. The system pulls data from the USGS every fifteen minutes, which is the frequency at which the sondes report. The result is a lag compared to a hypothetical system with zero latency, and the code interpolates between current and prior readings to recreate the changes of the river within those intervals. Back at the panels, I outfitted four Raspberry



*Animas* installed at the Vicki Myhren Gallery, University of Denver (Wes Magyar, used with permission)

Pi computers – small, inexpensive Linux-based machines – with high-quality audio cards. Additional software on the Pis establishes a connection to the server and adjusts the gain of the audio output according to its calculations.

For the final piece, the panels are suspended from the ceiling in a row a few feet away from the wall at chest height, and when they sound together, they create a complex drone of shimmering harmonics. The sonic effect is similar to that of a gong, though without the initial strike and continuing indefinitely. What changes as the river changes is the timbre, otherwise known as sonic “color;” which repositions the nature of that term and underscores its special resonance with respect to the *Animas*. Modulating the gain of any one panel ends up shifting the physical interaction of waveforms from all of them, altering the quality of presence expressed by the whole. Side by side, the array of discrete elements that comprise the panels communicate each metal as distinct through their visual richness, while, through the process described above, the resulting sound exceeds their individual contributions.



*Animas* installed at the Vicki Myhren Gallery, University of Denver (Brian House)

I named the work, simply, [Animas](#). Visitors' reactions to the piece have emphasized its quality of presence, as they themselves become animated. Invariably, after viewing the work as a whole, they approach the panels and turn their ears to within inches of the surfaces, or they walk past each one at close range. There is an intuitive transition, then, between visual and auditory experience, or rather somatic experience, given how proximity to the ear puts the panels in line with the entire torso. In the case of the lead panel, there is an ambivalent feeling that accompanies that proximity, given the toxicity of the substance. Moving outward, within the context of *Storm Warning*, the sound tied the various pieces of the exhibition together with an ambiance that underscored the ineluctable nature of the subject matter.

Developing *Animas* has done much to advance my understanding of how sounding materials might reckon with complex ecological relationships. To this end, I believe the work draws meaningfully from precedents in art while maintaining a distinct character specific to its interests. But there is more to be learned. In particular, *Animas* relies uncritically on problematic infrastructure through which contemporary data "mining" is a significant source



of ecological stress, both in terms of the energy-intensive processing of data as well as the extraction of rare earth metals used to manufacture those processors. I made this compromise to incorporate the real-time USGS data. And while the material efforts of the SUIT Water Quality Program are referenced in the piece, I do not foreground the practical, political importance that conventional data analysis has for the SUIT and Navajo Nation. Nor, for that matter, has an indigenous approach to animacy played a role in the development of *Animas*, whose construction via reference to my own white settler culture may ultimately be insufficient to address the interdependencies at stake. Other approaches might be less bound by formal exploration, do more to engage with local knowledge practices, and be more mindful of the “turbulence that might reveal the conditions” (Helmreich 2015: 225) of hidden digital infrastructure.

That said, *Animas* has been well-received, including by the scientific community. Corresponding with Steltzer throughout the development process resulted in a paper presentation at the American Geophysical Union: “Seeing Orange, Feeling Blue: Sound Art as an Approach to Bridge the Gap Between Public Perception and Scientific Understanding of Risk” (2017). While scientific communication per se is not the purpose of the work, given the beleaguered relationships between the public, scientists, and government agencies such as the EPA, multiple modes of understanding must be pursued if issues such as acid mine drainage are to be relatable without being oversimplified. This is all the more important with the recent and regrettable transformation of the EPA under the Trump administration into an agency that actively impedes progress toward environmental justice.

According to Mel Chen, the concept of animacy complicates the distinctions between what is alive and what is inert, what is natural or cultural, and what is of the self or of the other (2012: 3). While such binaries are endemic to many Western representational strategies, sound art provides an alternative means of conveying an animated and animating presence. *Animas*, for example, is not abstract. It is not a depiction of the Animas River, nor a memorial of what existed prior to the Gold King Mine spill. Rather, it resonates with the “congregational agency,” as Bennett puts it (2009: 20), of a river that braids together the categories of human and non-human over multiple temporalities.

<https://soundcloud.com/brianhouse/animas>

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