Media-N | Journal of the New Media Caucus
Spring 2025: Volume 21, Issue 1, Pages 1–19
ISSN: 1942-017X

Introduction: Media and Climate

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ABSTRACT

Beyond the important insight that digital media exert a material influence over climates, this special issue marks two acute developments as central to the ambiguous relation of the terms *media* and *climate*: the proliferation of data-driven technologies across environments and a coinciding desire to seek out a politics and ethics beyond the history of Western humanism. The introduction thus sets out to frame this special issue's interest in media and climate in relation to an emerging body of critical-media scholarship focused on the agency of technological and environmental processes, while also arguing for a specificity posed in relation to the material histories of race, colonialism, and dispossession shaping legacies of "human" agency and its future possibilities. We consider the aesthetic challenges posed by climate change, whether through conflicting media temporalities, new media art's ongoing culpability and participation in extractive techniques, or the overarching effects of media on social, perceptual, and cognitive registers, both globally and individually. By framing the contributions in this special issue within our introductory essay as integral to understanding the parameters of technical, political, and social approaches to climate knowledge in the *Now*, *Ongoing Past*, and *Indeterminate Future*, we seek to map the stakes of promoting an even-greater interdisciplinary shift in specificity regarding the capacious dimensions of environment and media through their ready proximity to other aspects that bear on climate-related issues, including finance, technology, politics, colonialism, race, information, affect, and culture.

INTRODUCTION: SENSING CLIMATES

In their call to rethink agency as the multi-scaled and distributed dynamics that operate outside of thresholds of the "human" subject, Alex Galloway and Eugene Thacker introduce a concept of media as *elemental*:

> The elemental concerns the variables and variability of scaling, from the micro level to the macro, the ways in which a network phenomenon can suddenly contract, with the most local action becoming a global pattern, and vice versa. The elemental requires us to elaborate *an entire climatology of thought*.[1]

This special issue takes up Galloway and Thacker's provocation for *an entire climatology of thought* as a starting point from which to map shifts in sense and sense-making in the context of an

"environmental turn" within media. A growing number of scholars understand contemporary media environments—emblematized by distributed multi-scalar computational sensing networks and data-collection technologies—from the perspective that greater-than-human modes of perception and sensory experience have, themselves, begun to emerge and then ecologize with these networks. Beyond the scope of a "media ecology" in which the environment has an impact on the inner workings of a system or network, these ecologies are multi-constitutive with as well as critical of the layers of environmental affect and sense-making that emerge from particular historical, material, and social formations. What is less certain is how subjectivity coheres through and across these *elemental* networks.

The challenge for any humanities-based inquiry then emerges as one pertaining to questions of the singular human in the long shadow cast by any of the so-called "Anthropocenes," alongside the genesis of technologies seeking to collapse difference across a multiplicity of human and nonhuman scales. How to conceptualize agency—as variable and asymmetric in force, for what and whom, including multispecies and nonliving capacities—given this recognition of the radical uncertainties elemental media provoke? Does the digitalization and automation of environments with large-scale computing systems promise to realize a world without "us"? Or do media's elemental dimensions harbor potentials for distributed and relational sense-making that would challenge naturalistic explanations of Western "anthropos," a matter long underscored by postcolonial scholarship and indigenous knowledge systems? Beyond the important insight that digital media exert a material influence over climates—whether in reference to the extractive infrastructures of silicon-chip production or resource-hungry data processing and artificial intelligence—the articles in this special issue take up the ambiguous relation of the terms *media* and *climate* to consider the methodological possibilities that media studies, post-colonial perspectives, environmental studies, and art history may contribute to media's elemental effects.

This issue's concern with media and climate arrives at an ongoing moment of recognition that individual human perception has been intercepted: it cannot encompass the totality of environmental and technological processes. Its limitations stand in contrast to the media witnesses of large-scale patterns and intragenerational climate revolutions. As Wendy Hui Kyong Chun wrote in 2014, "climate is not something we immediately experience: we are affected by weather, not climate."[1] Elemental media destabilize categorical assumptions around nature and technology spawned by such conceptions of the individual and further set in place by the legacies of Enlightenment thinking and Industrial modernity into multiple fields of reference.[2] "There are thousands of ecologies today," writes the media scholar Erich Hörl.[3] The expansion of film and media studies to include environmental terminology and a focus on the environmental registers of media infrastructures and materials tracks with this "breakthrough" in ecological thought.[4] *Climate*, too, has evolved beyond external, ultimately unknowable nature to articulate entire modes of sense-making across elemental registers, encompassing concerns of the weather, political affect, atmosphere, and its more ambient qualities such as a vibe or mood.[5] We mark the recent proliferation of *climates* (in the plural) alongside the expansion of media criticism's environmental consciousness as suggestive for these ambiguous dimensions of climates, whether we refer to the material infrastructures underpinning daily existence or the imagistic, haptic, and acoustic forms they shape.

Adding to a wealth of recent scholarship concerning media's relation to climate and proximal concepts of environment, ecology, and weather, the essays comprising this special issue grapple

with the aesthetic and cognitive challenges posed by climate change.[6] Climate change is also a problem of visualization, as Cahill, Jacobson, and Bao point out in their special issue on "Media Climates" in *Representations*.[7] Cinema, photography, and screen-based media are not only able to communicate the effects of a warming planet: they are unstable artifacts that can provide traces of their making via the very same techniques that have propelled capitalist modes of resource expenditure.[8] In this special issue, John G. Winn reiterates this scholarly trajectory in his review of Siobhan Angus's *Camera Geologica*: *An Elemental History of Photography* (2024). Angus locates the process of extraction as the determinant origin and continued engine of photography's status as a material object. The political and ethical significance of Angus's inversion, for Winn, is that it poses the question of photography's extractive materiality through alternative forms of sense-making: "What if, instead of viewing photography as a medium of light (of immateriality and revelation), we were to view it from the perspective of the mine—darkness, avisuality, geology?"[9]

Not coincidentally, avisuality is core to some of the aesthetic challenges posed by climate-related knowledge today. Many of these challenges were anticipated within the historical development of climate science itself, which, as the historian Paul Edwards has detailed, has been constructed out of processes of skepticism and "infrastructural inversion" rather than a clear-cut evolution of scientific precision and certainty.[10] Tracing the messy material lives of political and scientific concepts then, has helped scholars to challenge the taken-for-grantedness of concepts as seemingly self-evident as climate and environment.[11] In this vein, the historical contributions of media studies and art history are all the more valuable in their granular and material explorations of post-World War II systems design and aesthetics and their ties to environmental concepts, bringing the seemingly unassailable dimensions of mediatized environments and totalizing concepts of environmental control down to Earth. Furthermore, the work of art historians to revisit and interrogate previous narratives about systems art, notably its supposed technophilic dimensions and apolitical stance towards the military-industrial complex, has renewed interest in the "weirder dimensions" of systems and their sociopolitical implications.[12] Media genealogies of post-WWII cybernetics and systems science—a point we return to develop later in this introduction—have opened less obvious routes for understanding the complex entanglements of scientific modeling and empirical methods in ways linked to but also exceeding cybernetics' twentieth-century military investments.[13] Media and art history's interdisciplinary uptake of climate, then, is not restricted to concerns of disclosing the contents of the proverbial "black box" of climate change and digital technology but conveys how the complex material and social negotiations between humans, machines, and nature have always-already worked to denaturalize these categories across aesthetic and cultural domains.

As several of the articles in this issue demonstrate, media and art history can also offer powerful tools for rethinking dominant correlationist epistemologies and the general skepticism around computational modeling. Their contributions do not simply mirror mainstream calls for information transparency, the need for the accumulation of seemingly better data, or the creation of ever-more majestic attempts at the documentation of climate disasters.[14] As Amy Harris explores in her review for this special issue, "Modes of Climate Engagement: Three Recent Case Studies of Climate Change-related Exhibitions," climate science communication has begun diverging from the previous "deficit model," which presumes that denialism can be solved through the presentation of accurate information about climate change. Calling upon Lauren Berlant's notion of art's activist

potential, Harris tracks a shift towards multi-sensory exhibitions that include both digital and hybrid formats as a means to promote affective engagement with climate change.

The need for ongoing revision within climate science has become a clarion call for action by climatologists in the 2020s, as they admit that temperature rise has spiked to such anomalous levels that it outpaces any known models.[15] Meanwhile, public institutions have sought stable narratives through which to communicate the abstractions of climate science to wider publics. After all, climate skepticism does not merely revolve around the content of data presented as fact, but takes issue with *how* data mediate the knowledge object of *climate*, which does not directly couple to human sense.[16] From this view, challenging climate skepticism would be more than a simple matter of undermining oppositional conclusions by emphasizing causal logics, but one of redirecting the creative autonomy of global science beyond particular anthropocentric investments, which requires at its base level, a fundamental degree of separation from what can be experienced. The creative indeterminacy of science ideally leaves scientific knowledge, in Edwards's terms, "open to revision," and thus open to contestation and alternative outputs.[17]

Through identifying these climate-related challenges in a sensorial register, we seek to extend Chun's question at the nexus of media and climate: how to "make vivid the creative world of science" and its capacity to construct a world beyond what is given, when we are unable to sense the imperceptible risks inherent in this world?[18] The diagnostic of an Anthropocene condition amplifies this risk, as it promises us both the outcomes of a planet shaped in our image (negative as these outcomes may be) while also forcing a distribution of human agency across an ever-expanding network of non-human relations. How, then, to address the challenge that artificial or constructed environments pose to dominant knowledge systems without, as Mark B.N. Hansen puts it, "simply mirror[ing] the dispersed and multi-scalar operation of networks"?[19] Without rejecting Chun's important call to shift media theory's task towards "registering and negotiating unimaginable, invisible, and seemingly inexperienceable causalities and correlations," it seems crucial to seek out how the status of the human, and by extension human experience, is bound up with a radical ecologization of sensing and sense-making that coheres within today's networks and media environments.[20] The articles in this special issue take on these not-so-trivial questions as they make use of the destabilization of the human prompted by an environmental turn as the basis for new climatologies of thought and practices equipped for the environmental challenges of contemporary media and technologies.

The remainder of our introduction parses the potentials of what Thacker and Galloway call a "climatology of thought" for theorizing media and climate, paying close attention to social, political, and technological developments in climate knowledge in the last decade. Emphasizing a throughline between our (the editors') respective disciplines in media studies and art history with climate-related issues generated ways of seeing climate change in both more general and more narrow registers then it is usually treated: more general because the digitization and financialization of climates has expanded the term beyond environmentalist discourses, producing alien ways of sensing the world; more narrow because climate change and the so-called Anthropocene require a specificity posed in relation to the material histories of race, colonialism, and dispossession shaping the legacies and possibilities of human agency as a distributed ecology. We discuss these shifts in terms of: the *Now*, in which new-media temporalities and metrics have transformed the tools of climate science; the *Ongoing Past*, in which we map a genealogy of the environment as a highly mutable, historicized term under continual revision; and the *Indeterminate Future*, in which

climatology is taken to be a constitutive process of participation, a dynamic totality in which all elements of the universe are implicated, albeit unevenly and not without scalar disjunctures.

Bringing together media and sensing with a specific focus on *climate* also helps tease out another crucial dimension of environmental imaginations—they are bound up with global ideas of space and race that touch down in particular sites.[21] After all, one of the main criticisms lodged at the conceptualization of the Anthropocene is that by naming the singular human race ("we") as culprit, it minimizes the historical culpability of the powerful few countries and companies whose colonizing practices initiated this new era. For this reason, we, like many of the authors in this issue, advocate for ongoing research into local contexts, parsing out difference according to unstable categories of race, gender, and state, and an ongoing "postcolonial suspicion of the universal" that pricks at globalizing epistemes.[22] Following Axelle Karera, the focus on a single "we" dismisses the historical and ongoing suffering brought on by climate change through racialized difference, in which some lives are considered more valuable than others.[23] *Climate*, after all, comes from the Greek *klima* or "tilt," which includes a concept of geographic difference: we are unevenly distributed in relation to the sun.[24] This differentiated dimension of climates was decisive for European Enlightenment theories of human characteristics, well encapsulated in Kant's observation in his *Physical Geography* that in "the hot countries the human being . . . does not . . . reach the perfection of those in the temperate zones. Humanity is at its greatest perfection in the race of the whites."[25] The hopeful construction of a planetary "we" through the Anthropocene allows for the continuation and "unwillingness to account for past and current imperial injustices, coupled with a rampant inability to imagine alternative futures outside an apocalyptic state of emergency that is mostly inspired by a narrative of vitality, and in which disposable life or 'life-death' remains largely unaccounted for."[26] This is why Denise Ferreira da Silva's call to "unthink the world" begins with the premise that issues related to climate change are remediated along historical fault lines of racialization and empire that are implicit to global capitalism.[27] From this perspective, what is key for climate and technology justice is not merely an activist stance by scholars to address the urgent threats posed to communities in the Global South, but moreover, a challenge to the socio-economic and technological infrastructures that have oriented us towards compounding planetary catastrophes. As quoted by Andreas Malm: "we can never be in the heat of the moment, only in the heat of this ongoing past."[28]

The Now

The year 2013 marked the breaking of multiple climate records—among them, an increasing and unabated rise in global temperature, new landmarks for Arctic glacier melting, and shifts in seasonal behavior patterns for plants and animals.[29] Even so, climate skepticism abounded while climate crises became more acute. Denialist debates hindered political action addressing climate change by making appeals to a pure model of science (or more specifically, the perceived lack thereof in mainstream climate science methodologies). Both sides imagined a route to climate knowledge untouched by the messy political realm, regardless of the mutability of data via technical instrumentation, simulation models, geo-political coordination, and forms of mediation that make up what Edwards has referred to as "infrastructures" of climate knowledge.[30]

If, as a decade ago, Chun linked public skepticism to record-breaking temperatures as a shocking breach in causality as a rationale for belief and action, then the paradox for media critics in the mid-2020s reveals itself in forms of accelerated structural dissonance. The alliance between economic

and technological practices related to climate issues has not cohered into a rational set of practices but has proliferated in social contradictions and conflicting media temporalities—for instance, through the financialization of climate change solutions combined with deliberate increases in fossil fuel production.[31]

The development of climate technologies has reconfigured *how* climate is sensed and makes sense in ways that are deeply embedded in a range of material contexts. Andreas Malm and Wim Carton show in *Overshoot: How the World Surrendered to Climate Breakdown* (2024) that the digitalization of environments has transformed how climate-related crises are accumulated as technology and capital, mutating the deeply entrenched relationship between finance and the fossil fuel industry. According to Malm and Carton, the fossil fuel industry's substantial investments in projects ranging from exploration to extraction have locked us into "the sinking of fixed capital into the Earth," though often couched in green rhetoric.[32] The ongoing effect of these projects allows for the overshoot of planetary boundaries, measured in terms of CO_2 levels and temperature targets. What were once called limits now act as arbitrary markers that can be willfully surpassed as a tactic of delay more than denial: temperatures can rise while investors gain return on fossil fuel investments, all in wait for the coming development of carbon capture or other technologies that can reverse the norms that have been breached.[33] Limits, like rules, were meant to be retrofitted.

To put it otherwise, overshoot is fundamentally performative: it demands a speculative leap that is made possible through speculative metrics and technologies. It thus comes as no surprise that the accumulation of capital continues to drive the techno-liberal order's emphasis on geoengineering, carbon-dioxide removal, and other net-zero "fixes," enabling the expansion of the fossil fuel industry and related sectors. Overshooting is thus able to turn to fossil fuels in an effort to solve a contradiction inherent to capitalism itself: as the artists Tega Brain and Sam Lavigne have put it, "how to achieve ongoing capital accumulation on a finite planet."[34]

Yet following Brain and Lavigne, the mere fact that carbon trading and capture technologies are often less than effective in mitigating existing and future carbon emissions does not at all undermine the principles animating their development. Epistemologies of overshooting and offsetting aim to satiate the capitalist demand that *all* environmental processes be made measurable, computable, and fungible. As Brain and Lavigne discuss in their artist interview with the editors in this issue, "The history of measurement is the history of inventing new commodities … [o]nce things can be measured, they can be commodified."[35] Allied with processes of financialization, the demand for measurability furnishes the justification for the development of ever more speculative metrics and technologies for carbon-dioxide removal and other geoengineering processes that demand the widespread surveillance of material environments and human activities.

What particularly matters here is the recursive, temporal, and spatial logics of these development schemas. Technologies such as direct air capture, sulphate aerosol injection, and cirrus-cloud thinning may remain the stuff of science fiction, but their imagined future existence exerts sway over climate policy and infrastructure development in the present. The preemptive logic of green finance cashes in on the presumed future existence of these technologies and on managing the risks immanent to their lifecycle development paths. But these technologies are importantly also strategies of temporal and spatial displacement as each shuttles the environmental cost of techno-solutionism to someone, somewhere, or some other time, ensuring that colonial stratifications of space and resources will endure despite the amplification of climate risk at a planetary scale.[36] Data

accumulation too depends on the perpetuation of historical colonial power relations that support practices of wealth and resource extraction via technologies that measure populations in new ways.[37] But the contingency in the system, for Brain and Lavigne, also offers a reference point for collective intervention since the question of *what* counts and *how* it is counted is by no means settled.

The colonial logics underpinning climate knowledge are central to the relationship between increasingly autonomous networked and technologized environments and emerging varieties of climate skepticism. As the geographer Holly Jean Buck describes, many right-wing skeptics in the United States and other nations have embraced environmentalist concerns over the ramifications of geoengineering, arguing that these technologies mark a "last ditch effort" by Big Government to shield the masses from the true nature of climate devastation.[38] This type of skepticism aims to rehabilitate climate knowledge by deferring to a repertoire of tropes characterizing what Buck calls para-environmentalism or "Green MAGA": a discourse constituted by something akin to what Nicole Sansone Ruiz in this issue theorizes as a techno-political "texture." In the case of Green MAGA and proximal conspiracy theories, the agenda to uncover the hidden truth of climate change facilitates an appeal to (neo)liberal individualism. Even if such discourses accept the reality of climate-related issues, their appeals to causality aim to absolve responsibility by restoring a proprietary and upwardly mobile relationship to knowledge that has been withdrawn and replaced by more abstract computational modes.

In her contribution to this special issue, Sansone Ruiz demonstrates that what instills a politics within software is not merely that it is deployed towards political ends, nor that politics shape technological development. Rather, digital technologies carry implicit political metaphysics in how they define place, differentiate inside from out, and determine causality and modes of circulation. Sansone Ruiz writes that "conservative, right, and far-right ideologies gain a ready-made rhetoric in their creation of 'nature' as both an image and metaphor."[39] The visualization technologies that Sansone Ruiz considers in her contribution, like Google Earth's texture-mapping tools, do not simply represent nature, but rather functionalize epistemologies that collapse scales between social formations and organic principles. The operational trade-offs gained by such tools prioritize optimization through pre-determined perspectives, leading to normative assumptions that disregard accuracy for a frictionless "appearance of realism."[40] Ruiz's contributions thus adds to wider conceptions about how screens and digital apparatuses estrange us from the world and each other while also carrying with them Western principles of liberal individualism and their corresponding libidinal economies.

Following the philosopher Yuk Hui, the unilateral development of Western technology has produced a generalized sense of homelessness (*Heimatlosigkeit*) and technological escalation that can only intensify the longing for homecoming and a sense of belonging to an often originary culture and place.[41] It should not surprise us that concerns around climate and planetary-scale technology often come linked with new expressions of conservatism, anti-scientism, and anti-immigrant xenophobia. Nowhere is this more evident today as with the envisioning of the Environmental Protection Agency (EPA) by the Heritage Foundation's *Mandate for Leadership: The Conservative Promise*. Popularly known as "Project 2025"—a reference to the document's stated purpose to serve as a blueprint in preparation for the 2025 transition to a Republican presidency in the United States—the landmark political agenda outlines plans for the EPA that will

strike a balance between qualified public skepticism towards government bureaucracy and the critical need to implement its promise to protect public health and environments. Instead of a "perpetual process"—a term with important parallels to Edwards's "infrastructural inversion" necessary to the scientific process—that the Heritage Foundation identifies as a symptom of the department's over-regulation and over-reaching political ambitions, the agency's success will be tracked by "measured progress" conveyed to the public in clear terms.[42] "True transparency… will be reflected in all agency work, including the establishment of open-source science, to build not only transparency and awareness among the public, but also trust."[43] Project 2025's mandates for a conservative Environmental Protection Agency also offer a return to a world made knowable through the monitoring of "traditional" or "criteria" pollutants, referring only to contaminants with immediately observable impacts rather than those, like greenhouse gases, that can only be tracked over longer periods.[44] Consequently, only "tangible environmental problems" are prioritized, bounded by a fixed environment, measurable in time and space.[45]

Yet if the denial of implicit scientific skepticism has historically been put in the service of Promethean development agendas and the anthropocentric domination of nature, the contemporary climate ideologies—noted above as the technophilia of green finance and the technophobia of Green MAGA, or Project 2025's appeal to "back to basics" science—are more difficult to reconcile with standard narratives of progress and mastery. But this is where fine-tuned attention to the *materiality* of sensing can be instructive for engaging critically with the experiential challenges posed by today's media climates. Materiality here does not refer to the raw stuff of nature but to the effects of economic, ecological, cultural, and political interactions over temporal durations.[46] The material effects of electronic media—like data—are never only experienced at the moment of the event of mediation but remain present in the form of material temporalities whose fragmented and multi-scalar histories shape future mediations and potentials. The radical redistribution of agency with large-scale technical systems may inadvertently undermine those categorical suppositions that undergird technological modernity and the domination of nature.

From this view and taking a cue from post-phenomenological accounts of new media's sensorial impacts, we ask: Is it possible to bring a techno-historicist specificity to both climate knowledge and skepticism? The question itself points to certain limits inherent in both representational and phenomenological understandings of climate knowledge, a topic that multiple articles in this special issue deal with in-depth. Threading through the contributions to this issue is a granular attention to the concrete material circumstances shaping the production of climate knowledges that are constantly unsettled by their mediations. In his article "Political Climates: Proxy, Population, and Global Heating," Thomas Patrick Pringle builds off of Chun's insights into the correlational structure of climate data to theorize a "historiography of the weather," which names "a method attuned to the changing social contexts in which climate data is interpreted and climate change knowledge is thus based."[47] In tracking how narratives and representations of population growth in the U.S. political context, such as Paul Ehrlich's controversial *The Population Bomb* (1971), became proxies for global heating, the crux of climate's representational problem emerges for Pringle as a semiotic *and* historiographical one since "climate proxies both speak for something obscure as cause *and* portray that cause as evidence."[48] This dual nature of climate proxies is ultimately indicative of the limits of historiography itself, since the effect of climate data's primary "representational structure"—that of a proxy or analog for what cannot be directly felt or explained—is always linked to the metrics they perform in their full social and political contexts. If technological media, digitization, and globalization further destabilize the individual "human"

as the primary arbiter of meaning, then mediations and proxies must play an increasingly central role in generating environmental knowledge. However, this observation, as Pringle notes, leaves a particular aspect of media historiographies of environment and climate unanswered—why do *specific* representations of knowledge persist despite shifting practices of mediation and signification? Establishing the why and how of the correlation—the linking of data with causal knowledge—asks for a broader model of historical process and the construction of a genealogy in which we are able to pose these semiotic questions.

The Ongoing Past

As with "climate," "environment" is neither a static concept nor is its meaning uniform in a manner readily subject to technological capture and control. In the history of philosophy and science, the environment has transformed through mediations between descriptive and prescriptive contexts, moving from something anti-artificial to something that can be built or modified with technology. According to Florian Sprenger, it was only with the back translation of the French *milieu* into the 19th century evolutionary biology of Herbert Spencer that the term environment took on a certain spatial coherence (meaning that which *surrounds* an organism) distinct from its earlier condition as a purely relational formation.[49] "Ultimately," Sprenger writes, "the surplus value of the dyadic structure between surroundings and surrounded, which generated this aggregation of heterogenous factors, not only enabled the concept to be used in many areas, but also made *environment* itself into a transversal term."[50] This notion of the environment as grasped in terms of a circular relation capable of overcoming oppositions and binaries was decisive for international developments of ecology in the twentieth century, and later, for ecosystems ecology, which, thanks to the doubly self-referential *and* expansiveness of the concept, prepared the terrain for divergent biopolitical interpretations. The transversal connection of the terms—environment, *milieu*, *Umwelt*—may harbor a certain epistemological utility, such as it did with systems theory and environmental politics in the United States in the 1960s. But by the same token, their abstraction obscures the history of their political metaphysics (such as with the organicist *Umwelt*). *Environment* becomes broadly applicable to anything and everything, and to variable ends. We follow Sprenger in quoting Donna Haraway that "nothing is connected to everything; everything is connected to something."[51]

In the United States in the 1950s, the term "environment" was at once becoming codified to refer to a unified nature impacted by the toxic effects of civilization, while simultaneously expanding to become an integrative concept within numerous fields, such as medicine, psychology, the arts, and computation. With Sputnik I's introduction of satellites and their eventual networks as a material indicator of Cold War anxieties about the creation of artificial environments, two related valences of environment emerged: the "responsive environment" and the "counter-environment." The responsive environment describes operative systems construed through a nexus of human-technological-environmental inputs and outputs. Constituting what Bernard Dionysius Geoghegan has called an "ecology of operations," the U.S. military's SAGE (Semi-Automatic Ground Environment) system became an exemplar of this new, distributed agency.[52] By the 1970s, the responsive environment had become part of human-computer-interaction (HCI) beyond its military applications, encompassing what Larry Busbea has referred to as a process-based structure of "mutually formative actions in the human-environment system."[53] Marshall McLuhan's concept of the counter-environment also gave precedence to the new forms of sense-making necessary for understanding how, "with satellite and electronic antennae as probes, the planet ceases in a way to be the human environment and becomes a satellite itself."[54] Instead of lamenting the totalizing

programmability of spatial experience, McLuhan argued that artists, designers, and architects could create counter-environments—within media environments—that could stand in opposition to their potentially hegemonic effects.

McLuhan's counter-environments heightened forms of perceptual training such as "pattern recognition," through which individuals could organize information flows into discrete parts.[55] These techniques would make space for the aesthetic autonomy of embodied experience and thus point towards a post-representational idea of environment, that, in Busbea's words, "would also yield to the will of the environmentally aware, pattern-recognizing subject."[56] It is worth pausing on McLuhan's notion of an environmental pattern recognition here momentarily, for it carries (and somewhat surprisingly for a theorist often accused of an extreme techno-anthropomorphism) a degree of ambivalence that destabilizes causal conceptions of media's effects. It is telling that both the conception of the counter-environment and this new form of pattern-finding perception McLuhan described were influenced by architecture, planning, and urban design. Furthermore, McLuhan assumed the production of a potentially infinite number of environments nested inside other environments and counter-environments, such that "new media are not bridges between man and nature, they are nature."[57] Through a characteristically eclectic set of disciplinary translations, *environment* came for McLuhan to stand for an absent "totality of the psychological, somatic, cultural, technical, and natural aspects of these atmospheric shifts" that impact yet evade everyday experience.[58] In this view, it does not seem a far stretch to read environmental pattern recognition as a relative of what the literary scholar Frederic Jameson would later call "cognitive mapping," a link that provides a surprisingly unorthodox Marxian analytic for McLuhan's media phenomenology.[59] Nevertheless, the point is that McLuhan's environment remains ambivalent: its programmability presents an opportunity—though with no guarantee—for phenomenological access that also at once repositions it as an apparatus for biopolitical governance.

The recursive but ambivalent relation between nature and technology continues to resonate into the 21st-century through contemporary aesthetic practices that partake in distinct forms of world-making. Rahel Kesserling's contribution to this issue, "I Like to Think of a Cybernetic Forest Filled With Pines and Electronics: Mergings of Plant and Technology in Contemporary Art," makes this clear when she considers the "environmental imaginations" of connectedness in contemporary media-based art and science fiction, in terms of how both deploy "technology as a sensory link between non-human and human senses."[60] Attuned to contemporary debates in posthumanist critique of anthropocentrism in which the alterior *other* is defined in its binary relation to the superior human subject, Kesserling looks at how a concept borrowed from sonic media—*transduction*—functions within artistic hybridizations of plant-technology entwinements. Transduction, following Stefan Helmreich, refers to "how sound changes as it traverses media;" it is a mediation that directs thinking pointedly towards those registers that outlie sensory thresholds, such as with sonic waves' vibration of the eardrum.[61] In presenting forests as ecosystems, the aesthetic practices Kesserling looks to, such as Pierre Huyghe's *Variants* (2022), establish a set of transductive relations between technological and biological elements such that new and mutating natural laws emerge. The ecology is made weird as it reveals an environment not for us, rather than manifesting in a reductively instrumental idea of ecosystem services. Sensors and distributed computing technologies then do not merely capture and instrumentalize environmental data but are fundamental and internal to the processes of environmental becoming, which are here revealed to be always in excess of figuratively "human" sensory perceptions.

The essays focused on media art and aesthetics in this special issue all productively unsettle notions of anthropocentric sameness by turning to technical and material practices of sense-making. They home in on a central issue running through some strains of literary post-humanism and aspects of an ontological turn: We cannot reduce the turn away from the human to a mere discursive rejection of the epistemic basis of modernity lest we affirm those very same idealistic assumptions. The detrimental tradeoff is attention to material and historicity. This is why for Jung Choi, whose study of contemporary Chinese media artists focused on themes of inhuman nature, "other-than-human" ways of *doing* non-anthropocentric knowledge must involve more than a mere acknowledgement of ontological plurality. Choi describes these aesthetic practices in terms of what media philosopher Yuk Hui has called "cosmotechnics," a way of giving greater attention to the many ways technology has been perceived and constructed differently over time, according to geo-philosophical worldviews. The matter of articulating a cosmotechnics specific to local context grounds Choi's writing on contemporary art as well. For Choi, these artworks involve utterly nonhuman forms of agency that interact with each other through "cosmotechnics and its relationship to organismic and social forms of individuation [that] can help us envision the possibility of diverse technological futures."[62] These include works like Fei Lu and Jianheo Lei's *Watching TV Together* (2021), which Choi describes as "a bizarre tableau of plants debating with AI on chairs" along with Zheng Jin's *Water Calligraphy* (2018) and Jiajun Shen's *Windyhome* (2021), in which authorship appears to be deferred to the elemental environment in conjunction with technological partners, while still giving humans a partial perspective via producing a triadic relationship of human-technology-nature. In Choi's analysis, these works introject technical mediation right into the very heart of phenomenological experience. In doing so, they challenge the privileged autonomy of such a transcendental subject while reinventing the possibilities of a humanistic environmental agenda.

The Indeterminate Future

Following Choi and Hansen, it is the radical empiricism of the philosopher Alfred North Whitehead that helps us to understand what sensibility can potentially mean for contemporary datafied experience. If climates can only be understood by proxy, as documented by the examples offered in this introduction and special issue, then skepticism, whether qualified or conspiratorial, unequivocally follows in its wake. Given that a desire for primary and present experience retains a stronghold on human understanding, the questions at the crux of climate-science communication—namely, how to bring computation and data *within* the domain of experience as opposed to being withdrawn from it?—can help set an agenda for post-phenomenological media studies through Whitehead's critique of philosophical subjectivism.

What is unique to Whitehead's empiricism is what he refers to as the "doubleness" of direct perception, occurring in two modes: "perception in the mode of presentational immediacy" and "perception in the mode of causal efficacy."[63] These modes intersect with each other intermittently, through everyday experience. The point at which they meet can spur on a process of "symbolic reference" in which the data of sensory perception can supersede its initial state as a "reflex action" and is instead attributed to the more ambiguous perception of its material basis or causal efficacy.[64] Importantly for Whitehead, sense perceptions are no longer the primary mode of access to the world, but require and are exceeded by causal efficacy in order for one to be involved with any external environment or community.[65]

The utility of Whitehead's causal efficacy extends to the problem of sensory perception for mediatized experience. For Hansen, the key is "worldly sensibility," a term which describes the relative autonomy of non-human or post-human modes of sensing. In this form of sense-making, humans are taken to be one "element" out of many in the universe, not as a special, embodied subject but as a constitutive process of "participation (or implication) in other becomings."[66] Computational data, Hansen argues, is exemplary of such a worldly sensibility "because of its dual, simultaneous operationality as production of *and* access to data."[67] With each operation to access the world, data propagation also contributes to this world, and in doing so, expands the scope of worldly sensibility, ultimately shifting the economy of the senses relative to human experience. This is, as Hansen demonstrates, a truly pharmacological development for media, since at the moment that media appear to decouple from human experience to assume an environmental scope, so too does human consciousness lose its privileged access to a distributed sensory system. Crucially, to access the impact of this elemental dimension of sensibility—in which media affect the environmental surround *and* impact sensibility at scales that do not correlate to perceptual sensation—"we must move beyond the limits of our object-centered and body-centered models of media experience by pursuing a radically environmental approach" in which "every sensory event implicates a 'total situation' that vastly exceeds what it explicitly captures."[68] This radical distribution of agency as a worldly sensibility of techno-aesthetic configurations exceeds human sensory thresholds—or, at the very least, is not quickly coupled to them.

The integration of a worldly sensibility into our climatological methodology for studying art and media has ethical and political stakes. Such an analytic immediately challenges mainstream criticisms that refute or minimize the implication of human agency in the technologization of the environment and everyday life. Beyond the mediation of climate knowledge, the ongoing redistribution of sensemaking takes place within the broader transformations of the world into instrumentalized data ready for retrieval. Whether the point-and-shoot capture of flora and fauna and their near real-time classification by naturalist apps or the leveling of buildings and ancestral lands through targeted algorithms, the world is being remade with and without humans in old and new ways through the production of *climatologies of thought*. The politics of such discussions of the human are not mean to imply universal experience by a "we," but to begin shifting toward a greater specificity regarding the capacious dimensions of environment and media through their ready proximity to other aspects that bear on climate-related issues, whether finance, technology, politics, colonialism, race, information, affect, or culture. Such specificity now requires attending to hyper-local case studies of media and climate which form their own counter-environments to the globalizing, hegemonic forces of technocratic capitalism that work via multiscalar modes of avisuality and data correlation. This recognition invites further multi-disciplinary considerations that engage with aesthetic practices alongside environmental science, as well as the histories of media, visual studies, and art. The essays we have included in this issue begin to set a course for such considerations.

ENDNOTES

[1] Wendy Hui Kyong Chun, "On Hypo-Real Models or Global Climate Change: A Challenge for the Humanities," *Critical Inquiry* 41, no. 3 (Spring 2015): 690, https://doi.org/10.1086/680090.

[2] See: Donna Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (Routledge, 1991); Rosi Braidotti, *The Posthuman* (Polity Press, 2013); and Bernard Steigler, *The Neganthropocene*, ed. and trans. Daniel Ross (Open Humanities Press, 2018).
[3] Erich Hörl, "Introduction to General Ecology: The Ecologization of Thinking," in *General Ecology: The New Ecological Paradigm*, ed. Erich Hörl and James Burton (Bloomsbury, 2017), 1.
[4] For example: Sean Cubitt, *Finite Media: Environmental Implications of Digital Technologies* (Duke University Press, 2017); Matthew Fuller and Roger F. Malina, *Media Ecologies: Materialist Energies in Art and Technoculture* (MIT Press, 2005); Jennifer Fay, *Inhospitable World: Cinema in the Time of the Anthropocene* (Oxford University Press, 2018).
[5] Sverker Sörlin, "Environment," in *Companion to Environmental Studies*, ed. Noel Castree, Mike Hulme, and James D. Proctor (Routledge, 2018), 27.
[6] *Media-N*'s "Media and Climate" is one of many recent publications to focus on the material intersections between media and climate, for example: *Grey Room* 77 (Fall 2019); *Grey Room* 94 (Fall 2024); James Leo Cahill, Brian R. Jacobson, and Weihong Bao, eds., *Representations* 157, no. 1 (Winter 2022); Weihong Bao, Jacob Gaboury, and Daniel Morgan, eds., "Media/Environment," *Critical Inquiry* 49, no. 3 (Spring 2023). The proliferation of special issues on this topic corresponds with the formation of academic journals devoted to these topics, e.g., *Media and Environment* and the *Journal of Environmental Media*, as well as new publication series, e.g., *Elements* for Duke University Press. We apologize for any omissions, as many contributions have been made.
[7] James Leo Cahill, Brian R. Jacobson, and Weihong Bao, "Media Climates: An Introduction," *Representations* 157, no. 1 (Winter 2022): 4.
[8] For example, see: Jennifer Gabrys, *Digital Rubbish: A Natural History of Electronics* (University of Michigan Press, 2011); Siobhan Angus, *Camera Geologica: An Elemental History of Photography* (Duke University Press, 2024); Cahill, Jacobson, and Bao, "Media Climates: An Introduction," *Representations* 157, no. 1 (Winter 2022): 1–16.
[9] John G. Winn, "TK," *Media-N* 21, no. 1 (Spring 2025): TK.
[10] Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (MIT Press, 2010).
[11] For instance: Florian Sprenger, "Surrounding and Surrounded: Toward a Conceptual History of *Environment*," *Critical Inquiry* 49, no. 3 (March 2023): 406–27, https://doi.org/10.1086/723676.
[12] For the reference to its "weirder dimensions," see Johanna Gosse and Tim Stott, eds., *Nervous Systems: Art, Systems, and Politics since the 1960s* (Duke University Press, 2022), 6; also see: Eric C. H. De Bruyn and Luke Skrebowski, "On Environmentalities," *Grey Room* 97 (September 2024): 36–45, https://doi.org/10.1162/grey_a_00414; Melissa Ragain, *Domesticating the Invisible: Form and Environmental Anxiety in Postwar America* (University of California Press, 2021); and Alex Kitnick, *Distant Early Warning*: *Marshall McLuhan and the Transformation of the Avant-Garde* (University of Chicago Press, 2021).
[13] See: Orit Halpern, *Beautiful Data: A History of Vision and Reason since 1945* (Duke University Press, 2004); Bernard Dionysius Geoghegan, *Code: From Information Theory to French Theory* (Duke University Press, 2023); Fred Turner, *The Democratic Surround: Multimedia and American Liberalism from World War II to the Psychedelic Sixties* (University of Chicago Press, 2013); Ryan Bishop and John Beck, *Technocrats of the Imagination: Art, Technology, and the Military-industrial Avant-garde* (Duke University Press, 2020).

[14] Bill McKibbin, "Images of Climate Change that Cannot Be Missed," *New Yorker*, May 28, 2024, https://www.newyorker.com/news/daily-comment/images-of-climate-change-that-cannot-be-missed.
[15] Gavin Schmidt, "Climate models can't explain 2023's huge heat anomaly—we could be in uncharted territory," *Nature* 627, no. 8004 (March 2024): 467, https://doi.org/10.1038/d41586-024-00816-z.
[16] Chun, "On Hypo-Real Models."
[17] Edwards, *A Vast Machine*, 427.
[18] Chun, "On Hypo-Real Models," 703.
[19] Mark B. N. Hansen, *Feed-Forward: On the Future of Twenty-First-Century Media*, (University of Chicago Press, 2014), 3.
[20] Chun, "On Hypo-Real Models," 679.
[21] Denise Ferreira da Silva, *Toward a Global Idea of Race* (University of Minnesota Press, 2007).
[22] Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* 35, no. 2 (Winter 2009): 220.
[23] Axelle Karera, "Blackness and the Pitfalls of Anthropocene Ethics," *Critical Philosophy of Race* 7, no. 1 (2019): 32–56, https://doi.org/10.5325/critphilrace.7.1.0032.
[24] Edwards, *A Vast Machine*, 29.
[25] Quoted in David N. Livingstone, "Race, Space, and Moral Climatology: Notes toward a Genealogy," *Journal of Historical Geography* 28, no. 2 (April 2002): 164, https://doi.org/10.1006/jhge.2001.0397.
[26] Karera, "Blackness and the Pitfalls of Anthropocene Ethics," 34.
[27] Denise Ferreira da Silva, "On Heat," *Canadian Art*, October 29, 2018, https://canadianart.ca/features/on-heat.
[28] Andreas Malm, *The Progress of This Storm: Nature and Society in a Warming World* (Verso, 2018), introduction, Kindle.
[29] Chun, "On Hypo-Real Models," 675–676.
[30] Edwards writes that "knowledge infrastructures comprise robust networks of people, artifacts, and institutions that generate, share, and maintain specific knowledge about the human and natural worlds." *A Vast Machine*, 17.
[31] For example, Rob Nixon describes how the always-on temporality of capitalist media prioritizes climate-related sensationalism and spectacles that obfuscate and exacerbate the "slow violence" of environmental threats inflicted upon the poor in the Global South. See: Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Harvard University Press, 2011).
[32] Andreas Malm and Wim Carton, *Overshoot: How the World Surrendered to Climate Breakdown* (Verso, 2024), chap. 4, Kindle.
[33] William Rees, "Ecological Footprint," in *Companion to Environmental Studies*, ed. Noel Castree, Mike Hulme, and James D. Proctor (Routledge, 2018), 45.
[34] Tega Brain and Sam Lavigne, "All That Is Air Melts into Air," *e-flux architecture* (June 2024), https://www.e-flux.com/architecture/spatial-computing/592129/all-that-is-air-melts-into-air.
[35] Tega Brain, Sam Lavigne, Corinna Kirsch, and Rebecca Uliasz, "Sabotage, Implementation, and Expanded Geo-engineering: An Interview with Tega Brain and Sam Lavigne on Collaborative Practice," *Media-N* (TK).
[36] The Anthropocene as a planetary problem may be underestimating the cosmological scope of humanity's transformational reach, as researchers have begun calling for a "Lunar Anthropocene." See: Justin Allen Holcomb, Rolfe David Mandel, and Karl William Wegmann,

"The Case for a Lunar Anthropocene," *Nature Geoscience* 17 (2024): 2–4, https://doi.org/10.1038/s41561-023-01347-4.
[37] Brain and Lavigne, "All That Is Air Melts Into Air."
[38] Holly Jean Buck, "The Rise of Green MAGA," *Compact Magazine*, November 24, 2024, accessed November 24, 2024, https://www.compactmag.com/article/the-rise-of-green-maga/.
[39] Nicole Sansone Ruiz, "Looking at Nothing, Bigly: The Right-Wing Politics of Texture Mapping Earth," *Media-N* TK.
[40] Sansone Ruiz, "Looking at Nothing, Bigly," *Media-N* TK.
[41] Yuk Hui, "Planetarization and Heimatlosigkeit, Part 1," *e-flux journal* (June 2024), https://www.e-flux.com/journal/147/621569/planetarization-and-heimatlosigkeit-part-1.
[42] Mandy M. Gunaskera, "Environmental Protection Agency," in *Mandate for Leadership: The Conservative Promise,* ed. Paul Dans and Steven Groves (The Heritage Foundation, 2023), 417.
[43] Gunaskera, "Environmental Protection Agency," 417.
[44] Gunaskera, "Environmental Protection Agency," 426.
[45] Gunaskera, "Environmental Protection Agency," 420.
[46] This notion of media's materiality is with reference to Jennifer Gabrys' examination of digital rubbish in which she draws upon Walter Benjamin's concept of a "natural history." Gabrys, *Digital Rubbish*.
[47] Thomas Patrick Pringle, "Political Climates: Proxy, Population, and Global Heating," *Media-N* TK.
[48] Pringle, "Political Climates: Proxy, Population, and Global Heating," *Media-N* TK.
[49] The idea of a unified surrounding made it possible to think both an environment's complex relation and distinction to a coupled organism (that which is *surrounded*), which itself is understood to retain a degree of autonomy. See: Florian Sprenger, "Surrounding and Surrounded: Toward a Conceptual History of Environment," *Critical Inquiry* 49, no. 3 (Spring 2023): 301.
[50] Sprenger, "Surrounding and Surrounded: Toward a Conceptual History of Environment," 419.
[51] Sprenger, "Surrounding and Surrounded," 426. Quoted from Donna J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press, 2016), 31.
[52] Bernard Dionysius Geoghegan, "An Ecology of Operations: Vigilance, Radar, and the Birth of the Computer Screen," *Representations* 147, no. 1 (Summer 2019): 59–95, https://doi.org/10.1525/rep.2019.147.1.59.
[53] Larry D. Busbea, *Responsive Environments: Design, Aesthetics, and the Human in the 1970s* (University of Minnesota Press, 2019), 92.
[54] Marshall McLuhan, "Address at Vision '65," *The American Scholar* 35, no. 2 (Spring 1966): 196–205.
[55] The concept of pattern recognition for McLuhan was closely bound to his conception of architecture and technological environments as "accelerating" environmental processes such that they were made accessible to human perceptual thresholds. He writes, "As data can finally be processed very rapidly we move literally into the world of pattern recognition, out of the world of mere data classification"; also, "If the environment or process of change gets going at a clip consistent with electronic information movement, it becomes very easy to perceive human patterns for the first time in human history." Quoted from Larry D. Busbea, "McLuhan's Environment: The End (and "The Beginnings") of Architecture," *Aggregate* 3 (2015): 5-6, https://doi.org/10.53965/PDFI4090.
[56] Larry D. Busbea, "McLuhan's Environment: The End (and "The Beginnings") of Architecture," 10.

[57] McLuhan, *Counterblast* (Harcourt, Brace, and World, 1969), 14.
[58] McLuhan quoted in Busbea, "McLuhan's Environment," 2.
[59] Frederic Jameson, "Cognitive Mapping," in *Marxism and the Interpretation of Culture*, ed. Cary Nelson and Lawrence Grossberg (University of Illinois Press, 1988).
[60] Rahel Kesserling, "I Like to Think of a Cybernetic Forest Filled With Pines and Electronics: Mergings of Plant and Technology in Contemporary Art," *Media-N, PAGE TK.*
[61] Stefan Helmreich, "Transduction," in *Keywords in Sound*, ed. David Novak and Matt Sakakeeny (Duke University Press, 2015), 222.
[62] Jung E. Choi, "The Subversive Path: Art Toward the Neganthropocene," TK.
[63] Alfred North Whitehead, "Chapter IV. Organisms and Environment," in *Process and Reality: An Essay in Cosmology* (Macmillan, 1929).
[64] Alfred North Whitehead, *Symbolism, Its Meaning and Effect* (Macmillan, 1927), 81.
[65] Brooke Belisle similarly invokes these modes through forms of perception requiring "scalar, embodied visibility," such as Google Earth VR, that combine both pre-existing conceptions of the Earth. "As aesthetic strategies change, altering how the Earth's surface is comprehensively imaged and also how the whole world is imagined, this changes how the Earth's objective 'wholeness' and the world's abstract interconnectedness are conceived as pre-existing any form of representation." See: "Whole World Within Reach: Google Earth VR," *Journal of Visual Culture* 19, no. 1 (2020): 121, https://doi.org/10.1177/1470412920909990.
[66] Hansen, *Feed-Forward*, 16.
[67] *Feed-Forward*, 159.
[68] *Feed-Forward*, 162.

REFERENCES

Angus, Siobhan. *Camera Geologica: An Elemental History of Photography*. Duke University Press, 2024.

Bao, Weihong, Jacob Gaboury, and Daniel Morgan. "Introduction: Media/Environment." *Critical Inquiry* 49, no. 3 (Spring 2023): 301–314. https://doi.org/10.1086/723667.

Belisle, Brooke. "Whole World Within Reach: Google Earth VR." *Journal of Visual Culture* 19, no. 1 (2020): 122–136, https://doi.org/10.1177/147041292090999.

Bishop, Ryan, and John Beck, *Technocrats of the Imagination: Art, Technology, and the Military-industrial Avant-garde*. Duke University Press, 2020.

Braidotti, Rosi. *The Posthuman*. Polity Press, 2013.

Brain, Tega, and Sam Lavigne. "All That Is Air Melts into Air." *e-flux Architecture* (June 2024). https://www.e-flux.com/architecture/spatial-computing/592129/all-that-is-air-melts-into-air.

Brain, Tega, Sam Lavigne, Corinna Kirsch, and Rebecca Uliasz. "Sabotage, Implementation, and Expanded Geo-engineering: An Interview with Tega Brain and Sam Lavigne on Collaborative Practice." *Media-N* 21, no. 1 (Spring 2025): TK.

Buck, Holly Jean. "The Rise of Green MAGA." *Compact Magazine*, November 24, 2024. https://www.compactmag.com/article/the-rise-of-green-maga/.

Busbea, Larry D. "McLuhan's Environment: The End (and "The Beginnings") of Architecture." *Aggregate* 3 (2015): 5–6. https://doi.org/10.53965/PDFI4090.

Busbea, Larry D. *Responsive Environments: Design, Aesthetics, and the Human in the 1970s*. University of Minnesota Press, 2019.

Cahill, James Leo, Brian R. Jacobson, and Weihong Bao. “Media Climates: An Introduction.” *Representations* 157, no. 1 (Winter 2022): 1–16. https://doi.org/10.1525/rep.2022.157.1.1.
Chakrabarty, Dipesh. “The Climate of History: Four Theses.” *Critical Inquiry* 35, no. 2 (Winter 2009): 197–222.
Choi, Jung E. “The Subversive Path: Art Toward the Neganthropocene.” *Media-N* 21, no. 1 (Spring 2025): TK.
Chun, Wendy Hui Kyong. “On Hypo-Real Models or Global Climate Change: A Challenge for the Humanities.” *Critical Inquiry* 41, no. 3 (Spring 2015): 675–703, https://doi.org/10.1086/680090.
Cubitt, Sean. *Finite Media: Environmental Implications of Digital Technologies*. Duke University Press, 2017.
De Bruyn, Eric C. H., and Luke Skrebowski. “On Environmentalities.” *Grey Room* 97 (September 2024): 36–45. https://doi.org/10.1162/grey_a_00414
Edwards, Paul N. *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming*. MIT Press, 2010.
Fay, Jennifer. *Inhospitable World: Cinema in the Time of the Anthropocene*. Oxford University Press, 2018.
Ferreira da Silva, Denise. “On Heat.” *Canadian Art*, October 29, 2018. https://canadianart.ca/features/on-heat.
Ferreira da Silva, Denise. *Toward a Global Idea of Race*. University of Minnesota Press, 2007.
Fuller, Matthew, and Roger F. Malina. *Media Ecologies: Materialist Energies in Art and Technoculture*. MIT Press, 2005.
Gabrys, Jennifer. *Digital Rubbish: A Natural History of Electronics*. University of Michigan Press, 2011.
Galloway, Alexander R., and Eugene Thacker. *The Exploit: A Theory of Networks*. University of Minnesota Press, 2013.
Geoghegan, Bernard Dionysius. *Code: From Information Theory to French Theory*. Duke University Press, 2023.
Geoghegan, Bernard Dionysius. “An Ecology of Operations: Vigilance, Radar, and the Birth of the Computer Screen,” *Representations* 147, no. 1 (Summer 2019): 59–95. https://doi.org/10.1525/rep.2019.147.1.59.
Gosse, Johanna, and Tim Stott, eds. *Nervous Systems: Art, Systems, and Politics since the 1960s.* Duke University Press, 2022.
Gunaskera, Mandy M. “Environmental Protection Agency.” In *Mandate for Leadership: The Conservative Promise,* edited by Paul Dans and Steven Groves. The Heritage Foundation, 2023.
Halpern, Orit. *Beautiful Data: A History of Vision and Reason since 1945*. Duke University Press, 2004.
Hansen, Mark B. N. *Feed-Forward: On the Future of Twenty-First-Century Media*. University of Chicago Press, 2014.
Haraway, Donna. *Simians, Cyborgs, and Women: The Reinvention of Nature*. Routledge, 1991.
Helmreich, Stefan. “Transduction.” In *Keywords in Sound*, edited by David Novak and Matt Sakakeeny. Duke University Press, 2015.

Holcomb, Justin Allen, Rolfe David Mandel, and Karl William Wegmann. "The Case for a Lunar Anthropocene." *Nature Geoscience* 17 (2024): 2–4. https://doi.org/10.1038/s41561-023-01347-4.

Hörl, Erich. "Introduction to General Ecology: The Ecologization of Thinking." In *General Ecology: The New Ecological Paradigm*, edited by Erich Hörl and James Burton. Bloomsbury, 2017.

Hui, Yuk. "Planetarization and Heimatlosigkeit, Part 1." *e-flux journal* (June 2024). https://www.e-flux.com/journal/147/621569/planetarization-and-heimatlosigkeit-part-1.

Jameson, Frederic. "Cognitive Mapping." In *Marxism and the Interpretation of Culture*, edited by Cary Nelson and Lawrence Grossberg. University of Illinois Press, 1988.

Karera, Axelle. "Blackness and the Pitfalls of Anthropocene Ethics." *Critical Philosophy of Race* 7, no. 1 (2019): 32–56. https://doi.org/10.5325/critphilrace.7.1.0032.

Kesserling, Rahel. "I Like to Think of a Cybernetic Forest Filled With Pines and Electronics: Mergings of Plant and Technology in Contemporary Art." *Media-N* 21, no. 1 (Spring 2025): TK.

Kitnick, Alex. *Distant Early Warning*: *Marshall McLuhan and the Transformation of the Avant-Garde*. University of Chicago Press, 2021.

Livingstone, David N. "Race, Space and Moral Climatology: Notes toward a Genealogy." *Journal of Historical Geography* 28, no. 2 (April 2002): 159–180. https://doi.org/10.1006/jhge.2001.0397.

Malm, Andreas, and Wim Carton. *Overshoot: How the World Surrendered to Climate Breakdown*. Verso Books, 2024.

Malm, Andreas. *The Progress of This Storm: Nature and Society in a Warming World*. Verso Books, 2018.

McLuhan, Marshall. "Address at Vision '65." *The American Scholar* 35, no. 2 (Spring 1966): 196–205.

McLuhan, Marshall. *Counterblast*. Harcourt, Brace, and World, 1969.

McKibbin, Bill. "Images of Climate Change that Cannot Be Missed." *New Yorker*, May 28, 2024. https://www.newyorker.com/news/daily-comment/images-of-climate-change-that-cannot-be-missed.

Nixon, Rob. *Slow Violence and the Environmentalism of the Poor*. Harvard University Press, 2011.

Pringle, Thomas Patrick. "Political Climates: Proxy, Population, and Global Heating." *Media-N* 21, no. 1 (Spring 2025): TK.

Ragain, Melissa. *Domesticating the Invisible: Form and Environmental Anxiety in Postwar America*. University of California Press, 2021.

Rees, William. "Ecological Footprint." In *Companion to Environmental Studies*, edited by Noel Castree, Mike Hulme, and James D. Proctor. Routledge, 2018.

Sansone Ruiz, Nicole. "Looking at Nothing, Bigly: The Right-Wing Politics of Texture Mapping Earth." *Media-N* 21, no. 1 (Spring 2025): TK.

Schmidt, Gavin. "Climate models can't explain 2023's huge heat anomaly—we could be in uncharted territory." *Nature* 627, no. 8004 (March 2024): 467. https://doi.org/10.1038/d41586-024-00816-z.

Sörlin, Sverker. "Environment." In *Companion to Environmental Studies*, edited by Noel Castree, Mike Hulme, and James D. Proctor. Routledge, 2018.

Sprenger, Florian. "Surrounding and Surrounded: Toward a Conceptual History of *Environment*." *Critical Inquiry* 49, no. 3 (March 2023): 406–27. https://doi.org/10.1086/723676.

Steigler, Bernard. *The Neganthropocene*. Edited and translated by Daniel Ross. Open Humanities Press, 2018.
Turner, Fred. *The Democratic Surround: Multimedia and American Liberalism from World War II to the Psychedelic Sixties*. University of Chicago Press, 2013.
Whitehead, Alfred North. *Process and Reality: An Essay in Cosmology*. Macmillan, 1929.
Whitehead, Alfred North. *Symbolism, Its Meaning and Effect*. Macmillan, 1927.
Winn, John G. "TK." *Media-N* 21, no. 1 (Spring 2025): TK.

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