

WIND AS MODEL, MEDIA, AND EXPERIENCE

Wind's Animacies

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This is an article about wind, dust, and their relations to life. It is a meditation on the liveliness of wind and airborne particles as they are experienced on the ground; in cultural texts including film, poetry, and oral history; and in the medium of satellite imagery. In dialogue with recent work in the social sciences and humanities that demonstrates how air and dust from the “South” are treated as foreign “intrusions” into Europe, this article proposes a focus on wind’s animacies to further probe and nuance these claims. Situated primarily in Italy and the Balkans, two places where the author has familial relations and, in the case of the Balkans, deep ancestral history, the animacies of wind are examined specifically in relation to *Scirocco* and *Jugo*, two interrelated southerly winds commonly blowing in spring and autumn that sometimes bring “Saharan dust” to Europe. As a framework and scaffold, the article draws from Mel Chen’s notion of “differential animacies”: the ways animacy is bestowed on humans, animals, elements, and objects in hierarchies that are both revealing and “leaky.” Exploring the animacies of *Scirocco* and *Jugo* shows how the wind acts as a force of de/humanization, as agency leaking across borders of life and nonlife, and as shape-shifting coauthor of collective memory.

I. Introduction

This article begins at an *area di servizio*, a rest stop off the motorway north of the Italian town of Novara. The stop is crowded with trucks boasting large banners: DISCORDIA, SANMARTI, HOPTRANS. Near the center of the parking lot is a children’s Play Land with a miniature slide. Inside Play Land, I unfold a V-shaped radio antenna and rest it on top of a seesaw, together with a connecting cable and a laptop. While drivers stretch their legs and peer questioningly at the hazy, yellow sky, a satellite crests the northern horizon, tracing an orbit in a slow, invisible arc overhead. As if conjured from the haze, an image of the weather is received by the antenna and slowly forms on my laptop screen. In step with the satellite, the image begins at the latitude of the North Sea and moves line by line across continental Europe, lengthening incrementally southward.

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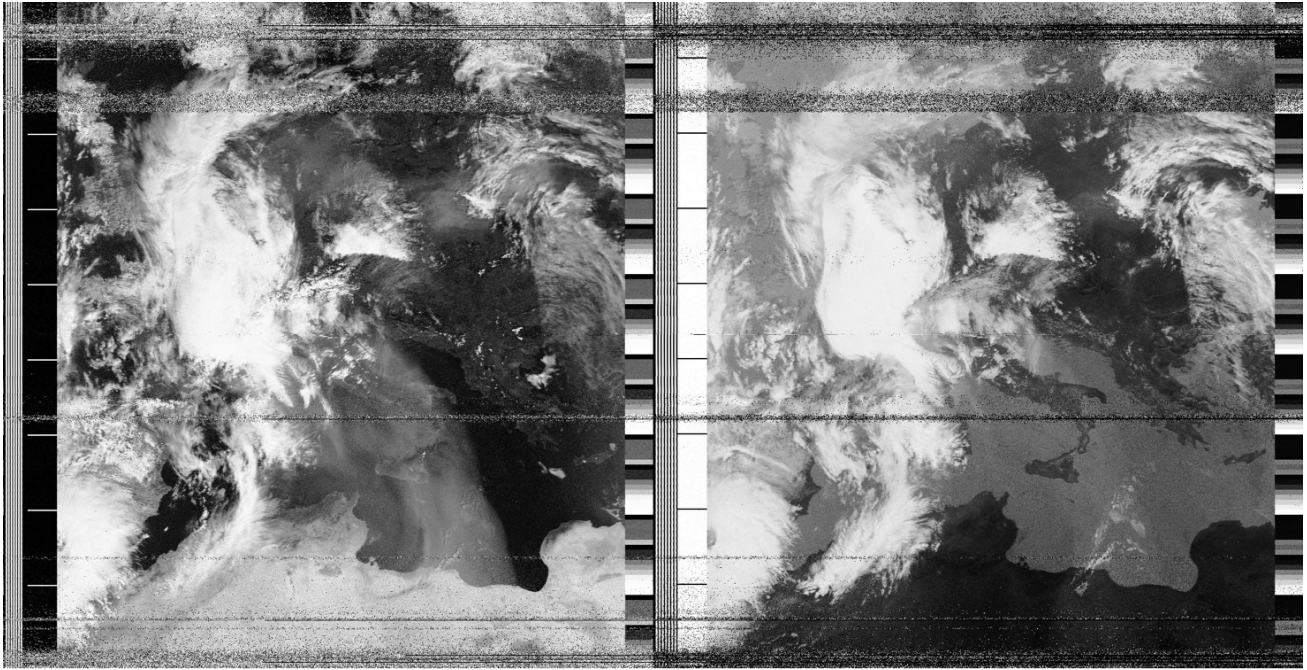


Figure 1: Image from NOAA-18 received by the author on 30 March 2024, near Novara, Italy. Source: open-weather CC BY 4.0 / NOAA.

Unusually, as the satellite crosses the Mediterranean, the pixels don't turn the near-black of light-absorbing water. Instead, they are feathery gray, blurring land and sea borders. Something is moving between sea and sky, surface and satellite. Later, as my partner guides our car back onto the busy motorway, we notice that raindrops are making small red marks on the windshield: inside each drop is a particle of dust.

This is an article about wind, dust, and their relations to life. It is a meditation on the liveliness of wind and airborne particles as they are experienced on the ground, in cultural texts, and in the medium of satellite imagery. In the vignette above, windblown dust blurs registers of visual perception as well as borders of land and sea in ways that trouble its classification as “inert” matter. Dust, a material that is “the residue of discarded life” (Amato 2000, 19) has dynamic and lively relations with wind, relations that evoke elemental permutations rather than “wind” or “dust” in isolation (Zee 2021). Wind is both a vessel for life, moving with particle-nutrients across landscapes and oceans, and a *force*, perhaps *the force*, of life. In literary studies, wind is *forze primordiali* (Ferrari, cited in Bardazzi 2017, 27), and for anthropologists, wind, “give[s] shape and direction to people's lives” (Ingold 2007, S31). For the human and more-than-human collective who coauthor with Bawaka Country in Northern Australia, winds are beings who “have language and knowledge and Law” (Country et al. 2015, 270). In dialogue with Mexican poet Victor Terán, Cymene Howe and Dominic Boyer write of *Biyooxho*: “the northern wind of ancient genealogy that emerged at the beginning of time, ‘pushing the world into existence’” (2015, 34).

These examples gesture to wind's enlivening of the body, its personhood, and its mythical power of world-making. Winds are topographers (Zee 2021), healers (Low 2007), choreographers (Nassar 2021), and storytellers (Bremner et al. 2022). Yet winds are not universally lively; they are not animate equally, or in the same way. From the standpoint of European cosmologies and ontologies of the elements, the standpoint from which I write, winds are sometimes personified or anthropomorphized, and other times rendered abstract, incomprehensible. For example, responding to Emmanuel Levinas's question "What is the origin of wind?" Mitch Rose writes, "The wind... appears from nowhere. Its presence forces itself upon us and we are at its mercy" (Rose 2013, 218; see also Adey 2015). In addition to being primordial, ungovernable elemental forces "from nowhere," the winds of Europe have long been linked to xenophobic fears and tendencies. As Vladimir Jankovic shows through the "'pathogenic' agency" (2007, S148) of winds in Victorian England, winds originating in the North are "bracing" and "hardening" in ways that inspire "robust moral ambition," while those from the South are "depressing," "pestilent," or "miasmatic" (2007, S151). Thus, winds are not only lively and animate in complex ways; they become racialized when their affects are linked to the geographies and cultures from which they are perceived to originate. Many of these animacies persist and are amplified today in the ways winds (and their permutations with dust or sand) are narrated and imagined.

It matters how winds and airborne particles are understood to be lively (or not), and how these qualities are rehearsed and performed. It matters because elements like air and wind "are not abstract categories: they are personal and political" (Engelmann 2020, 156). It matters because the movement of winds from the South parallels the increasing movements of human bodies and communities across the Sahara Desert and the Mediterranean Sea. The animacy of wind has stark implications for the liveliness—indeed the humanness—of these bodies. In this article, I employ Mel Chen's (2012) notion of "differential animacies" to explore the contemporary animacies of wind from the "South." For this article, this wind is called *Scirocco* and *Jugo*, though I recognize the many other names that attach to the wind. My work is situated in Italy and the Balkans, two places I have familial relations and, in the case of the Balkans, deep ancestral history. Before examining the many lives of *Scirocco* and *Jugo* in cultural texts, oral history, and bodily experience, the next section develops a critical framework for the elemental animacy of wind.

II. Wind's Animacies

As my partner and I drive eastward across northern Italy, my collaborator and friend Soph Dyer is standing in Diepoldpark, Vienna, holding a V-dipole antenna at waist height, parallel to the ground.¹ Dyer writes: “Why is it that I am so low energy? The sunlight that has made it through the dense, semicircle-shaped cloud over Vienna is dim and omnidirectional. It’s warm and humid. I woke early and could not fall back asleep” (Dyer 2024, n.p.). They continue: “Yesterday, after uploading my satellite recording... I noticed a large plume of Saharan Dust over the Mediterranean” (Dyer 2024, n.p.). The conditions described in Soph’s weather notes, of warmth, humidity, dense cloud, unease, and difficulty sleeping, are conditions long linked to the southerly wind *Scirocco*. In nineteenth-century Europe, the arrival of *Scirocco* was thought to be unhealthy, even deadly (Jankovic 2007). Today’s Wikipedia entry for *Scirocco* cites “unease and an irritable mood in people” (Wikipedia, n.d.). As Curtis Seaman, research scientist at the Cooperative Institute for Research in the Atmosphere writes in a blog post about *Scirocco*, the wind is “Hot, humid and full of dust. Perhaps it’s no surprise that the sirocco is believed to be a cause of insomnia and headaches” (Seaman 2016, n.p.).²

In Soph’s weather notes, the wind, and more specifically *Scirocco*, is an affective-meteorological force. While the word “wind” does not appear, the wind is felt in multiple ways, as “atmospheric attunements” (Stewart 2011). In Sara Ahmed’s sociology of feelings, bodies are affectively “open” to atmospheric events, to the ways these events “press,” “stick,” and “weigh” on skin surfaces, generating “atmospheric walls” as well as “feeling-in-common” (Ahmed 2004, 34). Many scholars join Ahmed in theorizing atmospheres as simultaneously material (meteorological) and affective. For Blanche Verlie, atmospheres are “more-than-human forces which can literally accrete, sediment, blossom, disperse, mushroom, melt, condense and precipitate” (Verlie 2019, 3; see also Adams-Hutcheson 2019). Or, as Trigg succinctly states, “an atmosphere is not only in the air but also under our skin” (2020, 3). *Scirocco* is an atmosphere “under our skin,” hovering under expressions of sleeplessness and “low energy.” In its warmth and humidity, it physically and affectively “sticks.” Thus, *Scirocco* is inseparable from its suspended droplets and particles and the “ways of life” it affects and changes. Lest we link *Scirocco*’s bodily impressions to its “southern constitution” too quickly, it is important to recognize that being affected by the wind as more-than-

1 In the first and final sections, the article describes experiments in NOAA (National Oceanic and Atmospheric Administration) satellite imagery capture, decoding, and weather reading that form part of the collaborative project *open-weather*, led by the author and Soph Dyer. In an *open-weather* project called *The Weather Between Us* that is ongoing at the time of writing, Soph and Sasha capture a NOAA satellite image each day from their respective locations and write “weather notes” about their experience of the weather on the ground. For more, see <https://open-weather.community/weather-between-us>.

2 These orientations to southerly winds and air masses are, of course, not ubiquitous in all cultures and lifeways. As humanistic geographer Yi-Fu Tuan wrote in the book *Space and Place*: “In west Africa the Temne regard east as the primary orientation. North is therefore to the left and considered dark; south, to the right, is light. To the Temne, thunder and lightning are prepared in the north, whereas “good breezes” come from the south” (Tuan 1977, 44).

meteorological is not the same thing as codifying it with xenophobic fears. To better understand how the wind interleaves with life, we need to explore its animacies.

The fields of cultural anthropology, geography, and media studies have recently come alive with winds: the deafening “Helm” winds of the British North Pennines (Veale, Endfield, and Naylor 2014), the dry, sandy winds of the Isthmus of Tehuantepec, Mexico (Howe and Boyer 2015), and the reversing wind of the South Asian monsoon that “carries the ocean to the sky... transforming its air and everything in its temporal wake with the possibility of life” (Bhat 2021, 6; see also Bremner et al. 2022). A social scientific fascination with wind is not new; winds are some of the most recognizable features of landscapes and places. However, these works on (and of) wind are engaged with wind’s relationship to life, its manifestation *as life*. The wind, for these authors, is not a condition, a background, or simply a carrier of other (living) things. The wind is “agential” (Veale, Endfield, and Naylor 2014). It is an author of emergence (Bhat 2022). Wind is “breath, omen, fertilizer, or destructor” (Jankovic 2007, S148).

However, to state, based on this work, that winds are “lively” would be to flatten dynamic, heterogeneous conversations that deserve more care. Further, any claim to the vitality of the elements needs to recognize the role of Indigenous communities in making cosmologies of animacy legible for Euro-American, anglophone scholars. From ideas of place-thought (Watts 2013) to perspectivism (Gómez-Barris 2017), from co-becoming (Country et al. 2015) to pluriversal worlds (De la Cadena and Blaser 2018; Sundberg 2014), numerous authors have described the constitution of life and sentience in Indigenous ontologies. Scholar and botanist Robin Wall Kimmerer writes about “relearning the grammar of animacy” in the language of the Potawatomi Nation: “language [is] a mirror for seeing the animacy of the world, the life that pulses through all things, through pines and nuthatches and mushrooms” (2017, 131). In addition to the references above, I encourage readers to look to Todd (2016, 2017), Liboiron (2021), Wright et al. (2020), and writings by coauthoring collective Bawaka Country et al. for resources on Indigenous ontologies. My goal in this article is to examine narrations of winds in southern and southeastern Europe to explore how the life, liveliness, and animacy of these winds are constructed. Tracing the “grammar of animacy” of *Scirocco* and *Jugo* requires close reading these winds’ characteristics and politics, their surfacing in alarmist news stories, cultural-poetic forms, and vernacular expressions. Tracing winds’ animacies means discerning how winds materialize beyond the edges of visibility through the “political technologies” (Bennett et al. 2022, 732) of satellite images, and how a satellite image, as a site of optic authority, animates and deanimates winds in particular ways. Engaging the animacies of *Scirocco* and *Jugo* means identifying their cultural histories as affected and shaped by “capitalism, and the colonial order of things” (Chen 2012, 30).

As a framework and scaffold for this analysis, I draw on linguistic, disability rights, queer, and critical race scholar Mel Chen, for whom animacy is a lens and a tool with which to grapple with the forces, mobilities, and transmutations of life. Animacy is defined as “the quality of liveness, sentience, or human-ness of a noun or noun phrase that has grammatical, often syntactic, consequences” (Chen 2012, 24). In *Animacies* (2012), Chen explores texts, films, toys, toxins, oil spills, and artworks to investigate “differential animacies”: the ways animacy is bestowed on humans, animals, elements, and even abstract concepts in hierarchies that are both revealing and “leaky.” In Euro-American discourses, animacy hierarchies usually place able-bodied, white, heteronormative, male subjects at the top (with most animacy) and women, differently abled, queer, and racialized peoples lower down (less animacy), followed by nonhuman animals, plants, and materials such as metals or particles (Chen 2012). Chen writes, “If we must keep company with such ontological closure, it nevertheless remains eminently possible for us to seek out and affirm the wiliness within” (Chen 2012, 237). If this article, by virtue of its authorship and location, “keeps company” with Euro-American discourse, my task is to “*affirm the wiliness within*,” to examine the different and plural ways in which the wind comes to attain animacy.

To affirm the wiliness within is to recognize how animacy “leaks” beyond animacy hierarchies, revealing the paucity of these hierarchies and the complexity of life and liveliness, their “ambivalent grammaticalities” (Chen 2012, 30). Chen offers us a framework for examining these animacies. First, for Chen, “Animacy ‘encodes forces’ without being beholden to the categories of life and nonlife” (2012, 227). In other words, force, as a power to move or to change, is a signal of animacy that troubles the life/nonlife binary. Chen (2012) elucidates this elemental force in their study of the Deepwater Horizon oil spill and subsequent, publicized efforts to “kill” the offshore wells from which oil flowed, while maintaining “ways of life” for those on the shore. For Chen, this “toxic spill was a *lifelily* thing: *lifelily*, perhaps, beyond its proper bounds. The well itself was alive, and not only because something had flowed out of it with such vivid animation” (2012, 227). Second, animacy is manifested by materials that transgress boundaries of containment. Chen follows toxic lead molecules that are “leaky” and “mobile”: “lead appears to undo the purported mapping of lifeliness-deadliness scales onto an animate hierarchy. Not only can dead lead appear and feel alive; it can fix itself atop the hierarchy” (Chen 2012, 167). Third, and finally, animacy is expressed through transmutations and transmogrifications, where the elements perform their capacities to alter, recombine, and differentiate. Chen writes, “In an unstable realm of animacy... alchemical transformation... goes beyond a vitalism that infuses given boundaries with lifelines” (Chen 2012, 129). While Chen elaborates several other markers of differential animacy, these three analytics—*force*, *leakiness*, *transmutation*—are useful for engaging the animacies of wind.



Figure 2: Still from *Io Capitano* (dir. Matteo Garrone), 2023. Reproduced under UK fair dealing legislation.

In the following section, I examine the animacy of *Scirocco*, probing how the wind moves between poles of life and nonlife, material and immaterial, origin and memory.

III. What the Wind Remembers

In the film *Io Capitano* (dir. Matteo Garrone, 2023) the wind circles and moves with two young men traveling from Senegal to Sicily. The two protagonists, Seydou (Seydou Sarr) and his cousin Moussa (Moustapha Fall), are pulled north by visions of their futures and a desire to make music in Europe. Their choice to leave Dakar is not easy. Seydou's mother (Ndeye Khady Sy) forbids him to leave, saying, "You have to stay here and breathe the same air as me." Defying her order, Seydou and Moussa join a current of other travelers heading north to Libya, first by bus, then by overcrowded truck, and then on foot through the sand dunes of the Sahara Desert. The desert landscape depicted in the film is inhospitable to life, revealing half-submerged remains of human bodies in the sand, but it also offers a sense of the spiritual and otherworldly. After Seydou witnesses the death of a woman in the heat, he envisions her body floating in the air just above his head, her feet freed of the scorching sand and her iridescent green clothing swirling in the wind ([figure 2](#)). Holding her hand, Seydou attempts to guide her back to the group, but she soon disappears into the sky. Remembering Seydou's mother's demand—*You have to stay here and breathe the same air as me*—the film can be read as a depiction of the horrors of migration from sub-Saharan Africa to Europe, culminating in the refusal of European coastguards to rescue the boat that Seydou ultimately pilots to Sicily. Yet it can also be

read as a narration of contact between human bodies and the landscapes they traverse to move north: the ways the sand, sea, and air affect traveling communities while also holding them, carrying them onward.

As they travel north, Seydou and Moussa move with the wind. More specifically, they move with a wind known as *šurūq* (Arabic: شروق), related to the word East, *aš-šarq*. This wind is called *Khamsin* in Egypt; *Simoom* in Palestine, Jordan, and Syria; *Ghibli* in Libya; *Chilli* in Tunisia and Algeria; *Sirocco* or *Scirocco* in Italy; and *Jugo* in the Balkans. The wind occurs as tropical air masses are pulled northward by low-pressure cells in the Mediterranean Sea. By low-pressure cells, I am referring to areas where warm air is rising. As the great equalizer, air (in this case from the south) rushes in to take its place. As it does so, this air transforms along the way. It transforms with dust, sand, pollen, water, spiders, spores of fungi, smoke, and other emissions. It also brings energy, the heat from landscapes and surfaces it has encountered. It is a wind that weathers beneath and above ground, entering crevices of soil and rock, stirring geology and sculpting topography. In the poem “L’agave sullo scoglio” (Agave on the cliff) in the book *Ossi di seppia* (Cuttlefish bones), Italian poet Eugenio Montale (1925) invokes *Scirocco*:

O scirocco, rabid gale
 that parches
 the cracked green-yellow ground;
 and high above, thick
 with livid flashes,
 a few wisps of cloud
 scud past and vanish.
 Baffled hours, tremors
 of a life that slips away,
 water through fingers;
 unapprehended events,
 shadow-lights, quakings
 of earth’s unstable things;
 O stifling wings of air
 now I am
 the agave that hugs the crevice

in the cliff,
 flinches from seaweed arms groping
 from the surf, jaws agape, clawing at the rocks;
 and in that seething
 of every essence, my buds clenched tight,
 incapable of breaking into bloom, today I feel
 this rootedness of mine
 is torture.

Scirocco is a “rabid gale / that parches.” It is “stifling wings of air” that stir the surf and send “seaweed arms groping.” The poem portrays a diversely animated world, from the wisps of cloud that “scud past and vanish” to the “seething / of every essence.” In contrast, the poet, figured as an agave, is “clenched tight / incapable of breaking into bloom.” For poetry scholar Adele Bardazzi, these and other poems of *Ossi di seppia* manifest wind as a force, “out of the *io*’s control” (2017, 26). Yet, remembering Chen’s framework, the wind’s seemingly uncontrollable, elemental *force* also makes it an amplifier of life: *Scirocco* stirs up the surf, the soil, the air, and far deeper “quakings / of earth’s unstable things.”

Across vernacular traditions, literature, and politics, *Scirocco* is a wind with animacy. It is the protagonist of poems and writings and a conspirer in lore and legend. In the contemporary moment, however, this animacy hovers in the many scholarly claims that *Scirocco*, or the “Saharan dust” it sometimes travels with, are “othered” by European publics (e.g., Tironi and Calvillo 2016; Sabin and Cantos 2023; Lahoud 2016; for this claim in a southeast Asian context, see Calvillo and Garnett 2019). For Lucy Sabin and Jorge Cantos, Saharan dust “[d]isturbs European cartographic imaginaries of enclosed spaces and systems, provoking encounters and frictions with material and immaterial b/orders” (2023, 1041). Analyzing news media from “Saharan dust” events in Europe between 2021 and 2023, the authors observe that “words such as *irruption*, *intrusion*, or *invasion* are commonly employed, often with an insinuation of a geographically symbolic threat or attack heading towards Europe” (2023, 1041; emphasis in original; see also Sabin 2024). We need to “unsettle the idea of the dust as a foreign entity,” writes scholar and architect Nerea Calvillo as she advocates for greater attention to the specificity of air, “how it interacts with humans and other-than-humans, and what it does in the world, materially, geographically, socially, symbolically” (2023, 62). Indeed, as Sabin (2024) convincingly argues, tracing and challenging the “foreignness” of air, wind, and dust is important to destabilize notions of “fortress Europe” and, more broadly, to critique racist institutions. However, the move to “other” an air current in media and

popular culture needs further attention, not only because it tells of deep cultural and colonial histories, but also since it suggests “slippages” of animacy (Chen 2012) that potentially destabilize or reify the very ontologies and institutions doing the othering.

The *Scirocco* that brought “Saharan dust” or “sand” across the Mediterranean to Europe on the weekend of 29 March–1 April, 2024, was relatively minor compared to previous such events. Indeed, in an update on the weather for the widely celebrated weekend of Pasqua, the major Italian news station RAI does not mention dust or sand, but only “an African anticyclone that will bring a significant increase in temperatures everywhere” (RAI 2024, n.p.).³ Elsewhere, sand, dust, and *Scirocco* received more attention (e.g., Musso 2024). On news websites and blogs, the words “sand” and “dust” are often interchangeable, and wind is folded into descriptions of these materials. In these public accounts, wind *is* its particle content, exemplifying what Jerry Zee (2021) calls *wind-sand*. Wind, sand, and dust perform emergent material, affective, and political relations.

One example, from weather forecast agency Tempoitalia, speaks of these relations and the construction of wind’s animacies. In Tempoitalia, the *wind-sand* aroused “curiosity and amazement” (Giordano 2024, n.p.). The reporter elaborates, “This event was caused by the *transport* of fine sand from the Sahara, carried by the *Scirocco* wind, which changed the appearance of the atmosphere in an *almost surreal way*” (Giordano 2024, n.p.; emphasis mine). Continuing, the report says, *wind-sand* is an “*ospite inatteso*,” an “*unexpected guest* in our homes and cities” (Giordano 2024, n.p.; emphasis mine). If the beginning of these lines treats wind and sand as separate and infrastructural, highlighting the “transport” of sand by wind, the latter parts merge them together and emphasize the *wind-sand*’s uncanny, “surreal” and “curious” effect. In her study of arid landscapes and Black ecologies, Brittany Meché (2022) warns of European visions of deserts as simultaneously barren and the site of surreal and dystopian science fiction. Representing these landscapes in this way is both inaccurate scientifically and limits the multiplicity of ecologies and lifeways in arid zones. Importantly, however, Tempoitalia’s expressions differ dramatically from *irruption*, *intrusion*, or *invasion*, terms that figure the *wind-sand* as a threat akin to military attack. Rather, the dramatic slippage between *transport*, *surreal*, and *unexpected guest* blurs animacy borders, where *wind-sand* is characterized as inert, transportable matter in one breath and uncanny, dystopian life-form in the next.

In their study of lead toxicity, children’s toys, and white panic in North America, Mel Chen shows how the blurring of animacy borders, or the unmaking of lifeliness-deadliness scales, can entrench racist worldviews and

³ Unless otherwise specified, translations from Italian to English in this section and in the remainder of the article are by Teresa Cos. Many thanks also to Nicola Locatelli.

further establish hierarchies that characterize racialized bodies as less animate, less human. This is instructive for a study of wind's animacies when the *wind-sand* comes to signify the arrival of "unexpected guests" from specific geographies. News media accounts of the southerly *wind-sand*, or "Saharan dust," figure the African desert as the origin of the air arriving in Europe, and portray Europe as "receiver" of this current of air (Sabin and Cantos 2023). These accounts do not examine the interconnected relations of atmospheric convection in which air constantly moves from places of high pressure to low pressure, responding to differentials created by the uneven heating of the Earth by the sun. Just as the American lead panic animated lead beyond its status as inert matter on anglophone animacy hierarchies, and in doing so, amplified white America's fears of Chinese imports and people (Chen 2012), so too does animating *wind-sand* elevate air currents and suspended particles across animacy hierarchies, thereby heightening fears of these currents and particles as well as the humans whose bodies are imagined to originate in the same arid location: the African desert.

Are there other ways to animate winds and *wind-sands*, or metals such as lead for that matter, that do not reify existing hierarchies and xenophobic modes of thought? Are there ways to recuperate the liveliness of *wind-dust* and *wind-sand* to other ends? In an article titled "What the Sands Remember," Vanessa Agard-Jones proposes "sand as a repository both of feeling and of experience, of affect and of history" (2012, 325). The forensic properties of sand come together with a notion of sand as an "ephemeral archive" of queer intimacy (Agard-Jones 2012). This is not only because sand exists "at the point of nature's hesitation between land and sea" and "holds *geological memories* in its elemental structure" (Agard-Jones 2012, 326; emphasis mine), but also because sand "smooths rough edges but also irritates, sticking to our bodies' folds and fissures" (Agard-Jones 2012, 326). The sand that washes across beaches, drifts across continental borders, and leaks into and out of bodies complicates definitions of hard or soft, granular or wavelike, living or nonliving, and yet it is a "repository," a "hold" for memory. In another study of elemental memory, Christina Sharpe elaborates the notion of "residence time" from fluid dynamics research, defined as the amount of time that nutrients cycle through water, slowly changing density and elemental phases, to consider the temporality of Black suffering in and through the waters of the Atlantic (Sharpe and Lambert 2017). A similar approach, Sharpe and Lambert (2017) suggest, could be applied to the sands of the Sahara Desert, another "sea" that migrating bodies must cross to reach the Mediterranean. These examples interleave memory with sands, soils, and waters to propose elements as animate archives, as living repositories. Memory is thus a fourth analytic in an elemental "grammar of animacy." Reading Chen's framework of differential animacies together with elemental memory studies, sand—and, we might suggest, *wind-sand*—moves, shape-shifts, and transcends its status in animacy hierarchies in ways that do not necessarily re-entrench racialized and xenophobic patterns. Rather, like the seemingly inhospitable desert in

the novels of Nnedi Okorafor that “becomes the setting for developing a vision of society better able to accommodate alterity” (Kotecki, cited in Meché 2022, 69), sand becomes the lively host of “black ecologies” in all their “multiplicity,” memory, and “futurity” (Meché 2022).

To ask the question “what do the winds remember?” therefore has very different outcomes, for all kinds of materials, bodies, and beings, than Levinas’s version, “what is the origin of wind?” Displacing a focus on origins refuses a deterministic logic—indeed an environmental determinist logic—that links perceived climatological origins with “invading” or “unexpected” bodies. Shifting emphasis from *origins* to *memory* lends animacy to wind and its many elemental permutations (dust, sand) while highlighting the multiple histories, relations, and movements bound up with wind over time. Indeed, for Szerszynski, cyclonic movements of air, like the low-pressure systems drawing *Scirocco* north, exhibit “a working memory,” or “a memory of energy” (2019, 229). Winds create corridors of movement that become sites for “aeolian politics” in their repeated patterning over time and space (Howe and Boyer 2015; Engelmann 2021). Whereas a fixation on origins, much like the fixation on the geological origin of the Anthropocene, flattens power, temporality, and responsibility, memory foregrounds the specificity and politics of “geological life” (Yusoff 2013): how human collaborations with soils, sands, and winds over different temporal and spatial scales enable opportunities for (some) human flourishing, and foreclose others. This is what the wind remembers. In the following section, I consider the life and afterlife of *Scirocco*’s Balkan counterpart, *Jugo*, before returning to the satellite images of wind with which I began.

IV. What the Wind Writes

Ja sam vjetar bez oblika što daje oblik prahu.

I am the formless wind that gives form to dust.⁴

—Tin Ujević 1941

The question “what does the wind remember?” has a particular resonance for the communities living in the postsocialist nations of Southeast Europe, particularly the former Yugoslav states of Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia, and Slovenia. Memories of wind are part of the heritage and lived realities of the Balkans, but as I will propose, these memories also become reanimated in ways that link to shared social experiences of life under different political climates. During the southerly wind event of the last weekend in March 2024, celebrated as Easter (*Uskrs*) by Catholic and Eastern Orthodox communities and falling within the month

⁴ Translations from Serbian/Croatian/Bosnian to English in this section are my own, with review and editing by my mom, Diana Engelmann.

of Ramadan for the many Muslim communities of Bosnia-Herzegovina, Albania, and North Macedonia, the region experienced many of the same atmospheric conditions as in Italy. Indeed, given their geographical proximity, Italy and the Balkans experience very similar currents of air. Yet Balkan relations to wind emerge from a distinct culture of experimentation, a culture of revision and reorientation informed by the region's existence at the "crossroads" of Eastern Europe and the Middle East, and between communism and capitalism. All of this is reflected in animacies of wind and is crystallized in contemporary cultural responses to the arrival of "Saharan dust."

In southeastern Europe, the southerly wind is known as *Jugo* (from *Jug*, South), though context-specific variations are numerous: *Vedro jugo*, *diže jugo*, *pravo jugo*, *čisto jugo*, *fortunal juga*, *olujno jugo*, *sujo jugo*, *gnjilo jugo* (clear *Jugo*, rising *Jugo*, true *Jugo*, fortuitous *Jugo*, stormy *Jugo*, dry *Jugo*, rotten *Jugo*) (Yanai 2015). Winds are often referred to in diminutive or augmentative form to express variations in force, variations in animacy. In an essay on "*Semantika Vjetra*" (Semantics of wind), Małczak cites Predrag Matvejević's ([1987] 1999) writing on linguistic variations of wind that express strength and emotion: "*levantić* and *levantin* (smaller levant), *levantun* (larger), *levantarun* (very large) together with *levantar* or *levančar* which are pronounced angrily" (2006, 183). Vernacular phrases of wind include "chasing the wind with a hat," "catching the wind with the hands," or "holding on to the wind with one's teeth" (Małczak 2016, n.p.). *The Serbian Mythological Dictionary* recalls the folkloric idea that "If there was no wind, cobwebs would be caught from the ground to the sky and people would not be able to see where they were going, so they would hit their heads sometimes on a tree, sometimes on a rock" (*Srpski mitološki rečnik*, cited in Małczak 2016, n.p.). Sometimes on a tree, sometimes on a rock: the wind's relation to clarity and visibility is an important theme that resurfaces later in this section.

The wind, and specifically *Jugo*, animates cultural histories of the Balkans, carrying with it memories of struggle, economic change, and the dynamic weather of the Adriatic Sea. Slavic scholar Ulf Brunnbauer explores the political and social weather of southeastern Europe from World War II to the present through the lens of the Mirna sardine cannery in Rovinj, Croatia. In doing so, he shares an oral history interview conducted in 2019 with a senior foreman at Mirna:

The problems started in the 1990s, especially from 1995 to 2000, when the dolphins appeared. There were so many dolphins. They so much frightened the fish and then you can eat your own net (...) In earlier times [in the 1970s and 1980s], we worked a lot for Kuwait, and for Iran. And we worked a great deal for our army, for military provisions. (...) We had been trained in a different system. We were more western educated,

because we were, sometime, before that under Venetian rule, and then we were under Austria for 180 years. This means, my grandfathers, both of them, served under Franz Joseph. They made the railways; they made the harbour. (...) And something else I want to tell you: these big weather changes, if you heard about that three or four years ago, this was terrible here. This all stirred up the sea, there had never been anything like that. Because of a temperature difference of two, three degrees fish appeared that had never been seen here. (...) You know, there was “white *Jugo*” [warm winds from the south], which blows lightly during the day, and stronger in the evening. And warm. This was the death to the fishes. (Brunnbauer, oral history interview, 2019, 1)

This poignant vignette tells of dolphins, changing political rule, big infrastructure, and “big weather changes.” The temporal and thematic shifts in the vignette are significant. When the foreman describes how “the problems started in the 1990s... when the dolphins appeared,” it is difficult not to think about the regional political “problems” that arose in the 1990s and accelerated toward civil war, and ultimately to NATO airstrikes on Belgrade in 1999. The foreman evokes fear on many levels, between fish and dolphins, as well as fear of hunger: “you can eat your own net.” Moving back in time to the 1970s and 1980s, the foreman describes a period of socialist governance in which Yugoslavia’s economic orientation, at least for sardine production, depended on Middle Eastern nations. Going further back in time, the foreman identifies the “western” education of his ancestors under the Austro-Hungarian Empire and the Venetian republic. Fast forward again, this time to the 2010s in a now capitalist Croatia that has just joined the European Union, and there are “big weather changes” that “stirred up the sea,” including the *white Jugo* that is “death to the fishes.” In this vignette, changes in the weather of the Adriatic—its dolphins, winds, temperature, and fish populations—accompany, and sometimes seem to analogize, changes in political “weather” between Austro-Hungarian, Venetian, Yugoslavian, and contemporary neoliberal eras. All of these forces—from sea and wind to socialism and capitalism—co-create the conditions of life at Mirna.

Jugo is not just a force that acts on the lives of sardines—the beloved *mala plava riba* (“little blue fish”)—and those who make a living from them. As documented in an array of cultural, literary, and social spheres, in the Balkans *Jugo* brings *južina*, or “the weather conditions on the Adriatic when the southerly wind blows and when people feel uncomfortable due to high humidity and wind” (Jezislovac, n.d., n.p.). Though *južina* is directly linked to *Jugo*, and the terms are sometimes used interchangeably, *južina* is an account of the wind’s affects, how it is felt and experienced in the body. For Iva Ralica, writing in the lifestyle publication *CroatiaWeek*, *južina* means

“bad mood, fatigue, the lack of sleep, heavy breathing, rapid heart beats and even nervous behaviour” (2016, n.p.). Moreover, *južina* is not universal; rather it is most acutely felt by particular people:

Those who have not experienced it may laugh about it, but people that live near the sea in Croatia will vouch for it. Their body system is already used to this phenomenon and it follows them wherever they go. They can feel it even when the rest of the world doesn't. Wherever and whenever that might be. Now image that kind of life. It is a heavy burden to bear. OK, I am being a bit sarcastic here, but that's OK when a Dalmatian is writing.

Južina is a feeling that “follows” Dalmatians “wherever they go,” and “wherever and whenever” they may be. In a turn of dark humor, Ralica asks us to “image” what a “heavy burden” this is to bear. Described in this way, *južina* becomes more than a passing state. Rather, *južina* comes to attain animacy: it is a *feeling* that *follows*, an inescapable *kind of life*. Feelings, emotions, and concepts are, in Euro-American traditions, positioned low on animacy hierarchies (Chen 2012). Yet in this passage, *južina* gains lively qualities; in Ahmed's (2004) terms, it “sticks.” Indeed, for Ralica, it signifies a particular version of life that is unique to Dalmatian and Balkan experience. To stretch the “burden” of *južina* to the burden of memory of the still-recent conflicts in the Balkans would be to extrapolate far beyond the words of Ralica. However, remembering the Mirna fisherman's invocation of the *Jugo* among multiple forms of weather, and the widely acknowledged power of Yugoslav collective identity, especially for working classes (Petrović 2010), the burden of *južina* tentatively resonates beyond individual affective experience, as a facet of collective identity construction and shared bodily memory bound up with the politics of the region.

In the last few days of March and beginning of April 2024, *Jugo* and *južina* arrived in the Balkans, sparking (as in Italy) waves of online commentary and speculation. From Vitez, a village in Bosnia and Herzegovina not far from Sarajevo, schoolteacher Mario Bošnjak Matić posted a video on YouTube titled *Saharska prašina zamutila pogled i atmosferu* (Saharan dust clouded the view and the atmosphere) (1 April 2024; see [figure 3](#)). The video slowly pans from left to right, showing green fields, sheep, and rural houses in a distinct yellow-pink haze. Comments on the video are sometimes sarcastic: “Predivan pogled i prekrasna opuštajuća atmosfera...” (A beautiful view and a wonderful relaxing atmosphere...). Others reflect health concerns: “A svud je misimo u svici i ovde nemozes gladat a i disat poz” (And [the dust] is everywhere and here you can't see and breathe, greetings). Others state, “Kod nas u Rijeci nikada ovako prljava kiša nije padala. Auti presvlačenja blatom, n groblju bila 2.sata grobnicu prala sutra moram ponoviti da na nešto liči takvo blato nisam vidjela. poz.” (Here in Rijeka, we have never seen such dirty



Figure 3: Still image from Mario Bošnjak Matić's video on YouTube, *Saharska prašina zamutila pogled i atmosferu* (Saharan dust clouded the view and the atmosphere), 1 April 2024. Source: Public domain.

rain. Cars are covered in mud; I spent two hours cleaning the tombstone at the cemetery, and I have to do it again tomorrow; I've never seen such mud before. Greetings.) This last comment is perhaps most revealing. For Aya Nassar, dust "acts as a witness" and is "intertwined with writing history" (Nassar 2020, 8). Paying attention to dust, where dust collects, and what it obscures or makes visible tells much about ways of witnessing and "writing history." In contemporary European media, the object and surface that most often collects and displays "Saharan dust" is the car. Indeed, in *Aeropolis*, Nerea Calvillo offers a gallery of images of "Saharan dust" on cars; on these car-surfaces, unknown passersby write messages, from expressions of love to "NO" (2023, 109–13). In a parallel gesture to that of Matić, a YouTube video titled "La pioggia di 'sabbia' a Trieste" ("The rain of 'sand' in Trieste"), posted on 1 April by local Italian newspaper *Il Piccolo*, focuses overwhelmingly on the speckled surfaces of various parked cars (Lasorte 2024). The depiction of "Saharan dust" on a tombstone in Rijeka, and more specifically the labor of cleaning this tombstone, represents and animates the dust otherwise. In contrast to the playful tracing of initials on car windows, cleaning dust from a tomb is a fundamentally different gesture. It is a labor of memory: of maintaining surfaces to preserve the possibility to remember. The comment expresses the magnitude of this labor as well as a sense of obligation: *I spent two hours cleaning the tombstone at the cemetery, and I have to do it again tomorrow.*

Though the tomb in the comment is unspecified, its presence is important, and not only because of its exposure to *Jugo*. In the recent history of southeastern Europe, gravesites and places of burial were not always marked, let alone maintained. The Balkan Investigative Reporting Network documents that 40,000 civilians went missing during the conflicts in the Balkans in the 1990s. So far, “remains of around 28,000 people have been found in more than 1,500 clandestine gravesites” across the former Yugoslavia (Balkan Investigative Reporting Network 2021, n.p.). The Bitter Land database, launched in 2021 to support justice and memorialization in the Balkans, locates gravesites in “unmarked fields, illegal garbage pits, next to public roads or on the property of private companies” (Balkan Investigative Reporting Network 2021, n.p.). Only around 12 of the largest gravesites have been memorialized, and often only through the efforts of communities who are thwarted or discouraged by local governments (Ristić and Mulaomerović 2020, n.p.). Ristić and Mulaomerović elaborate:

At many if not most of these locations, war victims’ families are not even allowed to visit once a year to hold commemorations. Many of them see this as a continuation of war by other means—an attempt to deny what happened and erase the crimes from the collective memory. (2020, n.p.)

In light of this “war by other means” and attempts at erasure, the labor of cleaning a single tombstone from airborne dust is significant. For, in the Balkans, the labor of memorialization is a privilege rather than an assumed right. It is also a privilege, today, for those families attempting to trace loved ones along the increasingly perilous and police-guarded “Balkan Route” that navigates the edges of the European Union from Macedonia and Kosovo to Serbia and Croatia (Matejčić 2023). As the south wind blows, the ritual of maintaining the surface of a local tombstone is a willful, even stubborn act of memory. To link the act of memorialization with the blowing of *Jugo* is to propose that this wind does not only *animate history*—stirring up the sea and the dust, “weather changes” and political changes—it also *writes history*. *Jugo* may activate feelings of fatigue and melancholy, yet it also choreographs a return to the site of mourning. In the Balkans, *Jugo* and *južina* conspire in the political act of remembering.

“I am the formless wind that gives form to dust,” wrote poet Tin Ujević during World War II. The line evokes the elemental permutations of wind and dust, while highlighting the wind as a maker of form, perhaps an approaching “front,” at a time of sociopolitical upheaval. To explore, in another register, how *Jugo* participates in oral and written memory in ways that are inseparable from, yet irreducible to, narratives of conflict and loss, it is helpful to turn to a contemporary poem. In August 1999, only two months after NATO forces bombed Belgrade in Operation Noble Anvil,

known ironically in the Balkans as *Milosrdni anđeo* (Merciful angel), the Belgrade-born poet and literature professor Diana Engelmann (née Šatlan) writes “For the old fisherman on Hvar”:

They come out of purple
 Walls like random pines at dawn
 Taunting the south wind.

And dress their old boats
 In lace and feathers, turning
 Dry almonds into pigments and mist,

A self-taught technique, a backyard
 Ceremony for sparrows and fern, until
 In broken nets around the town square

They carefully plant seaweed
 And lavender, for a chorus of smiles
 And sweet wine, a brief stop

On their way to wide blue
 Where often vanish
 Those who rhyme.

The poem describes a scene of quiet ritual in the “south wind” as the “old fisherman” on the island of Hvar, Croatia, “dress their old boats / in lace and feathers” and “plant seaweed / and lavender.” To dress a boat in this way is to make it ceremonious and light, even lighter-than-air; to “plant seaweed / and lavender” is to sow life in both sea and land, much like the wind does. In this “backyard / Ceremony,” the fishermen make strange transformations and transmutations, “turning / Dry almonds into pigments and mist.” Almond, an important local food, becomes evanescent, immaterial; like sand, like dust. Writing from the Balkans in the immediate aftermath of the aerial bombardment of her hometown, Diana Engelmann depicts another set of elemental and affective relations born by *Jugo*, the south wind. Instead of portraying the horrors of airstrikes or the events that precipitated them, the poem interleaves *Jugo*’s animacies, the slow but persistent seeding of Adriatic

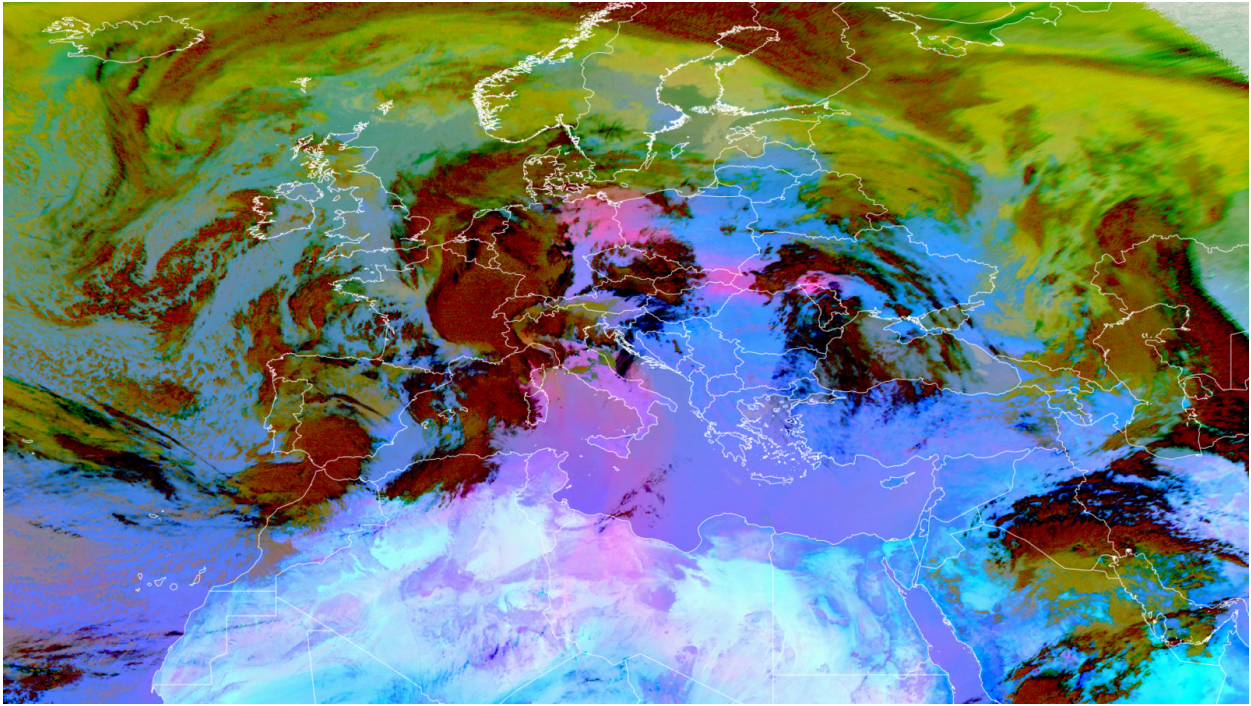


Figure 4: Satellite image from EUMETSAT (Meteosat) Dust RGB, 30 March 2024, at 10 UTC. (Shades of magenta indicate desert dust.) Source: EUMETSAT.

life (in so many “broken nets”), and a series of quasi-mythical rituals. The labor of the fishermen in this poem is different from that of cleaning dust from a tombstone, but it is nevertheless a labor of material obligation and memory.

From “taunting the south wind,” the fishermen are ultimately depicted as elemental poets who, like *Jugo*, leave only their “pigments and mist[s]” behind. While the final gesture is one of vanishing, or loss, the “carefully plant[ed]” world of this poem remains.

This article has travelled—wind-like—across borders of geography, language, culture, and medium, intertwining cultural texts, media sources, poetry, film, and secondary material. It is important to consider a final set of sources that evoke wind’s animacies at regional scales, between the ground and hemispheric currents. In the following sections, I return to another site of animacy: the satellite image. I examine how wind writes particles and escapes pixels in a medium of optical authority.

V. Drawn to the Dust

As science finds ways to map, measure, and optically diagrammatize the paths of swirling dust in turbulence patterns or the gentle sweep of arcs in compound curvatures, it posits a relation—if only as another type of *reminiscence*—to the fragility or transience of the phenomena it apprehends. (Leslie 2021, 102; emphasis added)

This article has explored the animacies of the southerly winds *Scirocco* and *Jugo*, elaborating what these animacies reveal about the wind as a force of de/humanization, an agency spilling and leaking across animacy hierarchies, and as shape-shifting coauthor of collective memory. As a final move, in this section I explore the animacies of the south wind through the medium of satellite imagery. I do so not to suggest a need to supplement the preceding material, or to suggest that satellite images offer a poetics of wind comparable to that of (human) poets. Neither is this a move to employ satellite images as all-truthful devices to counterbalance the “view from the ground.” Rather, in this section I examine satellite images to probe, from within and outside science, how these images animate wind. How does wind, in a satellite image, encode force? How does wind “leak” or “slip” through animacy hierarchies, or transform across elemental categories?

It is relatively rare to see satellite images presented publicly as multiple, unstable, or “leaky” forms. Satellite images are most often used to demonstrate authority. As objects, satellite images are “immutable mobiles” (Latour 1999), circulating easily and widely in science and the public sphere. Yet as many scholars and practitioners show, satellite images are also highly *mutable*: they can be crafted, edited, and manipulated in ways that elevate or obfuscate what they contain. Moving away from a form of positivism or empiricism that employs satellite imagery as truth, Laura Kurgan proposes to engage with satellite images in a *para-empirical* mode, “as not quite or almost, alongside the world” (2013, 35). Following Kurgan’s para-empiricism (2013), satellite images are sites of thinking and making and, I might add, sites of writing and living, too. A satellite image, by virtue of its recording, processing, analysis, and display, and because of its emergence from complex infrastructures of science, military, and politics (see Grossman 2023), represents an ontology, a way of being. Recalling Chen’s words: “If we must keep company with such ontological closure, it nevertheless remains eminently possible for us to seek out and affirm the wiliness within” (Chen 2012, 237). To “seek out” animacy in a satellite image is to recognize its ontology while close reading its “way of life.” Here, I close-read satellite images against the optical ontology of pixels; I affirm the animacies of wind.

To read a satellite image for wind’s animacies is perhaps a paradoxical task. In daily life, wind is visible only when it moves tree branches, leaves, birds, clothing, or the clouds. How can the force, leakiness, transmutation, or memory of wind be seen from above, from Earth orbit? As a NASA article states, “in the atmosphere, clouds can act like fingerprints for the movement of air” (2023, n.p.). Wind’s force is sensible when it makes “fingerprints,” when it “sticks” or “presses” in the atmosphere. To make fingerprints as clouds, the wind needs to become ocean: *wind-water*. Similarly, when wind “sticks” or “presses” with land, it is *wind-dust* or *wind-sand* (Zee 2021). Thus, to be seen by a faraway satellite, wind must be *turbid*: cloudy, opaque, or thick with material relation. For Esther Leslie (2021), “turbid media” are

all around us as toxic foams and polluted waters, and they are increasingly important to examine and describe, both within and beyond science. Leslie probes our relations to “turbid media,” asking,

How to think about turbid media, not from the perspective of the physicist measuring propagation of light and other optical properties for determined ends, but from the perspective of a viewer speculating on a moment of optical engagement in which particles float on the air, a moment in which there is an apprehension of turbid matter in apparent self-generated movement or pixels scattering widely? (Leslie 2021, 104)

Leslie temporarily decenters science's regimes of measurement and recenters the (nonscientist) viewer. The question, as I understand it, is how to think, but also how to feel, when we witness turbid matters. For Leslie, what emerges in this viewing, this “speculating on a moment of optical engagement,” is a slippage of animacy. Responding to a vignette by nineteenth-century chemist Michael Faraday, who describes seeing sand cast in the air from a hot-air balloon, Leslie writes, “Each turbid particle, each tiny part of this twinkling fog makes a *mark on the eye*, and what was insensible, inert, lifeless, becomes effective, remarkable, an *amplification of life* through an aesthetic sense of attention” (Leslie 2021, 106; emphasis added). By making “a mark on the eye,” otherwise “inert” matter transcends animacy hierarchies and becomes *amplified life*.

For Leslie, turbid media's “mark” is encountered not only in direct experience but also in “pixels scattering widely,” in digital imagery. She elaborates, “Digital image-making is *drawn to the dust*, the particulate, which it has itself apparently become” (Leslie 2021, 102; my emphasis). For example, “NASA's Multiangle Imaging SpectroRadiometer” “finds ways to make evanescence detectable, such as the stress factors on a curve, the agitation of the air, clouds, the wind” (Leslie 2021, 102). Without entering (yet) into the technicalities of satellite remote sensing instruments and the ways they are bound up with the phenomena they record, the wind in a satellite image “makes a mark” because the image-making apparatus is “drawn to the dust, the particulate.” Satellite instruments and their images “make evanescence detectable”; *they draw the dust*. To return to the quote that begins this section, science “posits a relation—if only as another type of *reminiscence*—to the fragility or transience of the phenomena it apprehends” (Leslie 2021, 102). As an artifact of science, a satellite image “posits a relation” and “another type of *reminiscence*,” another type of *memory*, to the wind and its dust. If satellite images are “drawn to the dust” and posit relations (as a form of memory) to the world's “fragility and transience,” then *wind-dust* and *wind-sand* move and leak among pixels, across thresholds of resolution, material turbidity and animacy. In the “moment of optical engagement,” wind animates.

On 31 March 2024, scientists Boris Mifka, Maja Telišman Prtenjak, Josipa Kuzmić, and Irena Ciglencečki released a report on the website of the Croatian Science Foundation titled *Donos saharske prašine tijekom uskrsnog vikenda 2024. godine* (The transport of Saharan dust during the Easter weekend in 2024) (Mifka, et al. 2024). The meteorological picture painted by these authors far exceeds the scale of the Mediterranean or the rhetoric of unidirectional flows of air. They describe how “a little west of Ireland, over the Atlantic, there was the centre of a deep and extensive surface based cyclone,” and how “it was accompanied by an upper level cyclone whose trough stretched southward all the way to northwest Africa” (Mifka, et al. 2024, n.p.). At the same time, “there was a pronounced south-westerly flow at upper level over the Adriatic and Croatia, while at the surface a strong and gale force southerly wind blew over the Adriatic, and a south-westerly wind blew over the mainland” (2024, n.p.). The report goes further than those of public commentators to explain the arrival of “Saharan dust” as part of a wider, hemispheric set of forces and flows. This is important in the Adriatic, as Mifka wrote in a personal communication, because of the dust’s implications for life. The “dust impacts marine biological systems. It brings nutrients for plankton which starts the food chain and photosynthesis” (communication with author, 2024; see also Mifka et al. 2022).

Accompanying their report, the scientists published a striking satellite image of North Africa, Europe, and significant portions of the Middle East. At first glance, the image is difficult to read. Europe is obscured by dark red and blue three-dimensional shapes that appear to be clouds but have dark, chromatic outlines, like floating drops of paint. Yet the most prominent feature of this image is its swathes of bright magenta. The caption identifies that “shades of magenta indicate desert dust” (Mifka, et al. 2024, n.p.). In the image, the magenta appears to cover the Mediterranean and southeastern Europe as well as parts of Algeria, Libya, Egypt, and Türkiye. In gaps of dark clouds, the magenta traces further north to central Europe, including Germany and Poland.

Reading closer, however, reveals more about how this satellite image has been “drawn to the dust” and how it “posits relations” to the wind. Let us consider an image recorded by the same satellite and animated with the same magenta hue on 30 March 2024 at 10am UTC (see [figure 4](#)). While I was holding a DIY antenna to the sky at a motorway rest stop in Italy and receiving an analogue image from a NOAA satellite, this digital satellite image was captured and created by the SEVIRI (Spinning Enhanced Visible and Infrared Imager) instrument on the Meteosat-10 satellite, which stays in geostationary position at 0 degrees longitude and scans Europe, the Middle East, and large parts of Africa and the Atlantic every fifteen minutes. SEVIRI detects four visible and near-infrared (VNIR) channels and eight infrared (IR) channels: in other words, it detects twelve different frequencies of radiation absorbed and emitted by the Earth. Each of the twelve channels

is identified with a wavelength in micrometers (EUMETSAT 2017). The magenta-pink of the dust is the result of a “Dust RGB” algorithm that combines three different infrared channels (wavelengths $12.0\ \mu\text{m} - 10.8\ \mu\text{m}$; $10.8\ \mu\text{m} - 8.7\ \mu\text{m}$; $10.8\ \mu\text{m}$) assigned three different colors: red, green, and blue. How does the *wind-sand* or *wind-dust* appear in these three channels of invisible radiant energy? By scanning for infrared, the SEVIRI instrument “exploits the fact that molecules absorb frequencies that are characteristic of their structure” (Wikipedia, n.d., n.p.). In other words, all materials absorb infrared radiation at frequencies that correspond to their material makeup. Therefore, dust particles are absorptive of infrared radiation in ways that reflect the materiality of the dust itself. Moreover, within each “channel” of infrared sensed by the satellite, dust is differentially absorptive. For example, in the “red” channel, the satellite senses infrared wavelengths between $12.0\ \mu\text{m}$ and $10.8\ \mu\text{m}$ (12 to 10.8 micrometers). As Fuell et al. (2016, 77) explain, in this range, “dust aerosols display greater absorption at $10.8\ \mu\text{m}$ than at $12\ \mu\text{m}$, whereas the opposite is true for thin clouds such as cirrus.” Thus, the Dust RGB algorithm senses differences in invisible radiation to distinguish between dust and thin cloud. Importantly, then, not only is dust sensed by combining three infrared channels, it is also the *differences* within these channels that the algorithm uses. Each set of differences in the red, green, and blue channels helps to separate dust from materials like ash, ice, cloud, or Earth’s surface (EUMETSAT 2017). Although there are quantitative inputs to the creation of a satellite image with the Dust RGB algorithm, the result is a *qualitative* image in which the intensity and hue of magenta corresponds to physical, material attributes (Fuell et al. 2016). According to the manual of EUMETSAT (2017, 1), the intergovernmental organization in Europe providing Meteosat-10 images and data, Dust RGB “works over deserts” so “we can follow its movement back to the dust source”; the algorithm is less useful when the dust moves over water, where visible light sensors better pick up dust’s reflectivity.

Wind-dust and *wind-sand* are animated in this satellite image in several ways. First, to “see” the dust and the air that carries it, three wavelengths of infrared radiation have been separated out of Earth’s many “background” emissions to be selectively recombined. Each of the three “channels” or “color signals” helps to identify some property of dust, whether its difference from ice or its difference from the land surface. *Wind-dust* and *wind-sand* lurk between wavelengths; dust is not immediately sensed, rather it is “distinguished” from other materials. This is a “positing of relations” to “turbid media,” relations that are “written” in bright magenta. Second, the fact that Dust RGB works better “over desert” than sea, and that this helps users “follow its movement back to the dust source,” reveals an underlying assumption that dust’s origins are important, and these origins are in the arid desert. In other words, science “draws [dust] back” to seek the “origins” of *wind-dust*. Finally, the choice of magenta as the color of dust is significant. Magenta is not what the dust “looks like” from space, as infrared radiation is not visible. However,

neither is the magenta “false” color. As Arcand et al. (2013) show in their study of astronomical images, the application of color to nonvisible radiation enhances “the informational quotient of the image because the colours reflect the processes inherent in these objects” (Arcand et al. 2013, 28). What emerges from scientists’ choices of color is, for scholars like Daston and Galison (1992), both interpretation and artistry. The “artistry” of the Dust RGB algorithm elevates and animates certain matters (and “informational quotients”) while deanimating others. In the sensing and construction of the satellite image, *wind-dust* and *wind-sand* are animated: they are *differentiated* from other turbid media and *drawn out* of background radiation; they are *traced* to their geographical and temporal *origins*; and they are *marked* in an expressive hue. Like the glittering sand cast from the hot air balloon described by Leslie (2021), this image invites a particular “optical engagement” and is “an amplification of life”. It is an amplification of life through an optical aesthetics that has nonoptical inputs.

What are the consequences of this satellite wind animacy? Does the transmutation of wind-sand from airborne particles to resonant frequencies to magenta pixels animate *wind-dust* and *wind-sand* otherwise? Does algorithmic wind animacy posit affective and political relations? What kinds of memory, or writing, attach to the “fragility or transience” of the wind in these images? For Fuell et al. (2016), writing of the application of Dust RGB to the tracking of “blowing dust” events in New Mexico, USA, the algorithm has had “significant operational value” in a region of increasing drought, enabling forecasters to send warnings to aviation authorities about poor flight conditions and to drivers on interstate highways. In contrast to the previous systems of dust detection that combined single-channel visible and infrared satellite imagery, Dust RGB is far better at “drawing the dust,” but its “qualitative” nature means that other datasets are still needed to confirm the *wind-sand*’s direction, concentration, altitude, and implications for air quality. Thus, the animacies of *wind-dust* and *wind-sand* in Dust RGB are linked to the stakes of institutional scientific analysis: of understanding the evolution of airborne dust events to warn aviation industries, the highway traveling public, or people with specific health conditions. Dust RGB “draws the dust” in satellite images to maintain specific infrastructures, modalities, and forms of (human) life. The algorithm therefore reveals hierarchies of value that map semi-neatly onto the Euro-American animacy hierarchies elaborated by Chen (2012). These hierarchies of value are not embedded in the molecular structures of aerosols or foretold in the direction of the wind; they do not respond to sociopolitical contexts or histories, in which wind, dust, and sand are differentially felt and animated; rather, they are operationalized in an algorithm and written in pixels that, in bright magenta, ask us to see (life) in a certain way. To make this claim is not to undermine the important contributions of science but to foreground that satellite images, as crafted and constructed objects, are not only tools for seeing, sensing, and evidencing. They are not only tools—useful tools—for meteorological

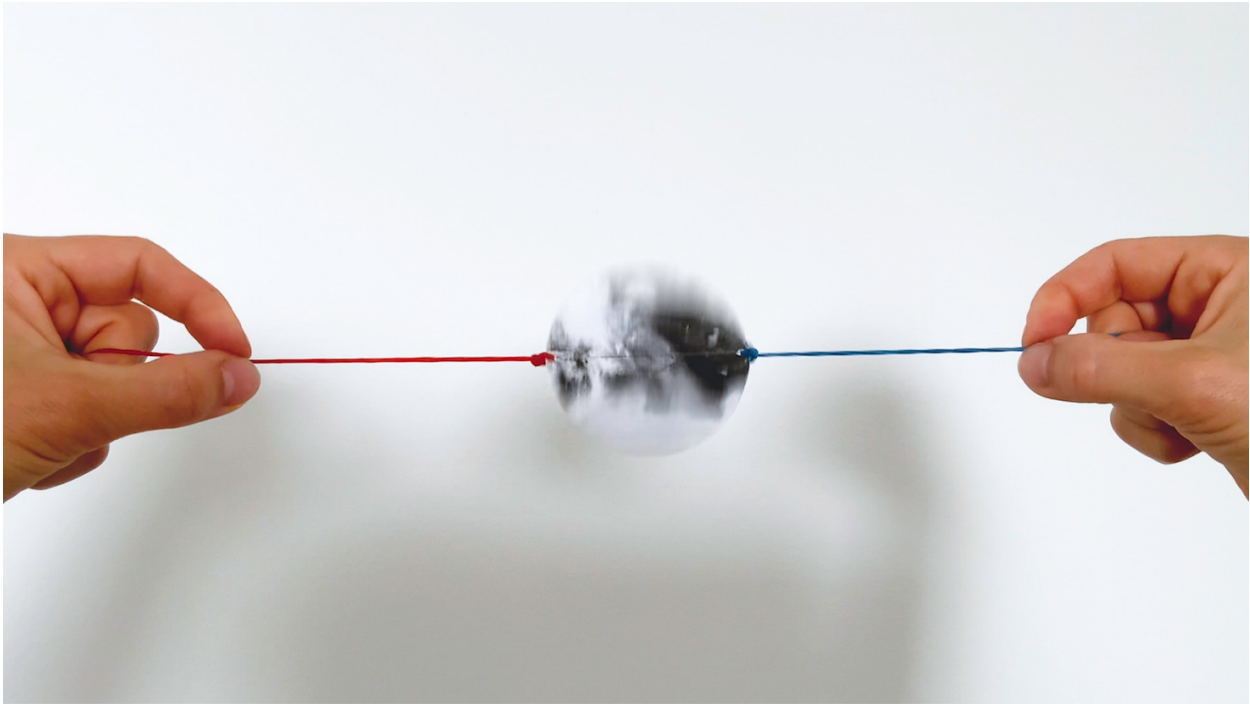


Figure 5: Thaumatrope of the NOAA satellite image in [figure 1](#), created by the author. Source: Teresa Cos.

and climatological study, or for critical forensic and activist projects. They are also sites for the making and unmaking of life, and potentially, the re-entrenchment of animacy hierarchies across “lifeliness-deadliness scales” (Chen 2012).

By reproducing these scales, satellite images over-write plural animacies emergent from the names, histories, and memories of the wind. Contrary to its popular conception as static visual object, dataset, or documentary, the satellite image is “a *lively* thing: *lively*, perhaps, beyond its proper bounds” (Chen 2012, 227).

This article began with an account of receiving a satellite image at the unlikely location of a rest stop on an Italian motorway. At first glance the image ([figure 1](#)) appears doubled, like a photograph and its negative. Yet these two “channels” are not opposites. One channel (left) is the Earth “seen” in the sunlight reflecting off land, sea, and airborne particles, and the other (right) is the Earth made sensible in infrared radiation. In the “visible light” channel, a light gray current, like a soft vertical brushstroke, traverses the Mediterranean between Libya and Italy. This “stroke” or “mark” is undetectable in the infrared channel, where the distinct, curved coastline of Africa meets the mid-gray of the sea without a hint of the drifting, phase-shifting particles and air currents above. Across these two channels, *wind-dust* and *wind-sand* hover between light and heat, visibility and invisibility. In its static, dichotomous form, the image posits two different sets of relations to the wind, two modes of “optical engagement,” two ways of “drawing the dust.” Perhaps more so than in the technicolor allure of Dust RGB, *Scirocco* and *Jugo* gain animacy in this image due to this slippage of presence, being “there” and “not there.”

Yet, if the image were a *thaumatrope*, an analog animation device in which a double-sided image flickers between sides, often handheld between two pieces of string, we might see something else: the wind permeating and phase-shifting, writing and erasing its own mark, undoing the image itself.

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