Ecologics

Wind and Power in the Anthropocene

Cymene Howe

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For Dominic

Contents

Joint Preface to *Wind and Power in the Anthropocene*

A Dynamic Duo

Welcome to our duograph. You may be entering into the duograph through *Ecologics* or *Energopolitics*, but in each case, we invite you to engage both sides of this work. The duograph is a new and experimental form that needs your active engagement. But what is a duograph? you might rightly ask. A duograph consists of two single-authored ethnographies that draw from a shared fieldwork experience and the same archive of research material. As a textual form, the duograph emerged from our field research (2009–13) on the political and ecological dimensions of wind power development in Mexico's Isthmus of Tehuantepec. The idea evolved partly out of experimental interest and partly out of necessity. The two of us spent many long evenings debating the significance of one aspect or another of the research and gradually found ourselves setting out from the center of the project in different theoretical and thematic directions. The fieldwork itself was a joint enterprise from start to finish; every interview, every meeting, every protest, involved both of us. We originally expected that the writing would follow a similar path toward a coauthored monograph. But while coauthoring offers many opportunities to learn and grow through dialogue, it also involves many compromises and ultimately must resolve in a synthetic voice and direction. We wanted to do this differently.

We eventually realized how important it was to each of us that we be able to tell a different part of the immensely complex story unfolding in the isthmus. Cymene wanted to spotlight the salience of human-nonhuman relations

in energy transition while Dominic wished to concentrate on unraveling the political complexity of wind power. We decided to experiment by elaborating our different analytics and interests in companion volumes that are meant to be read together. A working definition of the duograph would be a conversation between researchers that materializes in two texts, which do not require analytic synthesis or consensus. We view the duographic form as a way to produce collaborative scholarship that helps to make visible the multiplicity of stakes and attentions existing within the practice of research collaboration. The observations and arguments found in each of these volumes emerged from close dialogue and are by no means incommensurable, but neither are they serial parts of the same narrative. They speak in parallel, but not always in unison. Characters, dynamics, and events crisscross them, but they are approached through different analytic lenses. We hope that the duograph offers an experimental prototype in collective authorship that may be of value to other collaborators and other projects elsewhere.

Wind Power in Mexico

Our ethnography addresses a central question of our anthropocenic times: How can low-carbon energy transition happen? Or, put differently, What happens in those transitions? Who sets the agenda? Who—human and otherwise—is affected? And what are the political (in the broadest sense of the term) forces that shape the possibilities for low-carbon energy futures?

These questions initially took shape at Busboys & Poets café in Washington, DC, in late 2008 as we prepared for a move to Houston, Texas, a global epicenter of the fossil fuel industry. We considered a number of different fieldsites of renewable energy production that appeared to be poised for rapid development. We looked at the DESERTEC solar project in Morocco and nascent programs of wind development in Venezuela and Brazil among other cases. But the one that attracted and held our attention most strongly was Oaxaca's Isthmus of Tehuantepec.

A gap in the Sierra Madre Mountains creates a barometric pressure differential between the Gulf of Mexico and the Pacific Ocean, forming a wind tunnel in the isthmus where wind speeds regularly flirt with tropical storm strength. The *istmeño* wind is capable of overturning semitrailers with ease, uprooting trees, and stripping the paint off boats. This region—often said to be the least developed in a state that is the second poorest in Mexico—is considered to have among the best resources for terrestrial wind power any-

where in the world. That potential was first tapped in the mid-1990s through government demonstration projects designed to lure transnational investment in renewable energy production. But wind development only really gained attention and momentum during the administration of President Felipe Calderón (2006–12). Although Calderón's administration is better known for its drug war and for ceding sovereignty to cartels and capital, his climate change advocacy transformed Mexico from a pure petrostate into a global leader in low-carbon energy transition. Mexico passed some of the most ambitious, binding clean-energy legislation anywhere in the world, including a legal mandate that 35 percent of electricity be produced from non-fossil-fuel sources by 2024, with 50 percent of that green electricity expected to come from wind power, and with most of that wind power expected to come from the Isthmus of Tehuantepec. Private-Public Partnerships (PPPs) in wind energy development mushroomed rapidly. Between 2008 and 2016 the wind energy infrastructure of the isthmus expanded from two wind parks offering 85 megawatts of production capacity to twenty-nine wind parks with 2,360 megawatts of capacity, a 2,676 percent increase in less than a decade that has made the isthmus the densest concentration of onshore wind parks anywhere in the world.

Over the course of sixteen months of field research (in 2009, 2011, and 2012–13), we sought to cast as broad a net as possible and speak with representatives of every group of "stakeholders" in wind development in Mexico. Conversations with community members and corporate executives; federal, state, and local government officials and NGO staff; industry lobbyists and antiwind activists; conservationists and media professionals; indigenous rights advocates, bankers, and federal judges, all provided a meshwork of perspectives, which we traced as we moved between the many communities of the isthmus; to the state capital, Oaxaca City; and finally to the federal capital, Mexico City. In total, we conducted more than three hundred interviews and participated in hundreds of hours of less formal conversations. Working with a team of local researchers, we were able to conduct the first door-to-door survey of reactions to wind development in La Ventosa—one of two isthmus towns that are now nearly completely encircled by wind parks. We sat in on governmental and activist strategy meetings and toured wind parks. We marched, rallied, and stood at the fulcrum of many roadblocks erected by opponents of the wind parks. We witnessed the evolving politics of solidarity between *binnizá* (Zapotec) and *ikojts* (Huave) peoples whose shared resistance to particular forms of energy infrastructure brought them into alliance after hundreds of years of interethnic conflict. We

arrived at and left fieldwork as committed advocates for low-carbon energy transition. But our experiences in Mexico taught us that renewable energy can be installed in ways that do little to challenge the extractive logics that have undergirded the mining and fossil fuel industries. Renewable energy matters, but it matters more how it is brought into being and what forms of consultation and cooperation are used. We thus came to doubt that "wind power" has a singular form or meaning. Everywhere in our research, it was a different ensemble of force, matter, and desire; it seemed inherently multiple and turbulent, involving both humans and nonhumans. To capture that multiplicity, we came to think about our object of research as "aeolian politics," borrowing from the Spanish term for electricity derived from wind power, *energía eólica*.

Three case studies of aeolian politics came to absorb us in particular—Mareña Renovables, Yansa-Ixtepec, and La Ventosa—the first is the most complex and is treated at length in the *Ecologics* volume. The other two are highlighted in the *Energopolitics* volume. All three represent distinct configurations of aeolian politics; two can be categorized as cautionary tales of failure and the other as an example of the successful achievement of what for many is the renewable dream come to life. And yet success and failure were always in the eyes of their beholders. In all three studies we have sought to balance the fact of anthropogenic climate change and the need for global decarbonization against the local salience of vulnerable statecraft, demands for indigenous sovereignty, and the other-than-human lives that inhabit the Isthmus of Tehuantepec.

Volumes

ECOLOGICS

Ecologics tells the story of an antidote to the Anthropocene, one that was both a failure and a success. The Mareña Renovables wind park would have been the largest of its kind in all Latin America, and it promised immense reductions in greenhouse gas emissions as well as opportunities for local development. In *Ecologics* we follow the project's aspirational origins as well as the conflicts and ethical breakdowns that would leave it in suspension. Drawing from feminist theory, new materialisms, and more-than-human analytics, this volume of the duograph examines the ways that energy transitions are ambivalent: both anticipatory and unknown, where hope and caution are equally gathered. In the case of Mareña Renovables, distinct imaginaries of

environmental care and environmental harm were in conflict, effectively diagnosing the deeply relational qualities of energy and environment. The core argument that *Ecologics* advances is that the contemporary dynamics of energy and environment cannot be captured without understanding how human aspirations for energy articulate with or against nonhuman beings, technomaterial objects, and the geophysical forces that are at the center of wind power and, ultimately, at the heart of the Anthropocene.

The analytic architecture of *Ecologics* is both anticipatory and interruptive, and readers are encouraged to engage with the work in an itinerant and wandering way. Three chapters focus on the case of the Mareña project, tracing its inception and the policy regimes and economic conditions that allowed for its initial development (chapter 2, "Wind Power, Anticipated"), following it through a series of dramatic standoffs and protests against the park's creation among indigenous and mestizo communities in the isthmus (chapter 4, "Wind Power, Interrupted"), and finally witnessing the collapse of the wind power project itself resulting from multiple political, economic, and communicational impasses (chapter 6, "Wind Power, In Suspension"). These chapters are interrupted by others that focus on wind, trucks, and species respectively. The interruptive design is intended to mime the empirical, ethnographic dynamics of the research, where forces (like wind), technomaterial tools (like trucks), and other-than-human beings (creatures of all kinds) came to stall and vex human-designed notions of progress and infrastructural development. In *Ecologics* creatures, materials, and elemental forces are bound up with wind power as an analytic object, and they in turn invite new human responses to the paradoxes we face in a time of climatological uncertainty.

ENERGOPOLITICS

Energopolitics engages the case of Mexican wind power to develop an anthropological theory of political power for use in the Anthropocene anchored by discussions of "capital," "biopower," and Dominic's own neologism, "energopower." At the same time, the volume emphasizes the analytic limitations of these conceptual minima when confronted with the epistemic maxima of a situation of anthropological field research on political power. Those maxima not only exceed the explanatory potential of any given conceptual framework, they also resolutely demand the supplementary analytic work of history and ethnography. Concretely, the volume argues that to understand the contemporary aeolian politics of the Isthmus of Tehuantepec, one needs to understand, among other things, a contested history of land

tenure, *caciquismo* (boss politics), and student/teacher/peasant/worker/fisher opposition movements specific to the region; the phantasmatic status of state sovereignty within Mexican federalism; the clientelist networks and corporatist machinations of the Mexican political parties; the legacies of settler colonialism; a federal government anxious about waning petropower and climate change; and a vulnerable parastatal electricity utility trying to secure its future in an era of "energy reform." These forces are just as critical to Mexico's aeolian politics as the processes and dynamics that are duly captured by concepts such as capital, biopower, and energopower. *Energopolitics* is thus an urgent invitation for Anthropocene political theory to unmake and remake itself through the process of fieldwork and ethnographic reflection.

The invitation unfolds across five ethnographic chapters, each highlighting a different localization of aeolian politics. We begin with the as-yet failed effort to build a community-owned wind park in Ixtepec, then move east to the town of La Ventosa, which is successfully encircled by turbines that were built in the dominant PPP paradigm, yet has also been beset by uncertainty and unrest. We encounter the performative sovereignty of the state government in Oaxaca City as it searches for a means to regulate and profit from wind development and then journey northwest to Mexico City to interview those in government, industry, and finance who firmly believe they are steering the course of wind power in the isthmus. Finally, we return to Juchitán, which is not only the hub of local aeolian politics in the isthmus but also a town whose citizens imagine themselves to be the inheritors of a decades- if not centuries-long tradition of resistance against the Oaxacan and Mexican states. In this way, *Energopolitics* seeks to speak *terroir* to *pouvoir*, highlighting the need to resist anthropocenic universalism by paying attention to the profound locality of powers, agents, and concepts. As Claire Colebrook has argued, recognition of the Anthropocene should mark the "return of difference" that has been long called for in feminist and ecological criticism.

Collaboration in Anthropology

Our duograph belongs to a long history of anthropological collaboration in research and writing. In the early decades of North American and European ethnology, the discipline's close ties to fields like geography and natural history meant that the scientific expedition was an important apparatus of

anthropological research practice. In the late nineteenth and early twentieth centuries, projects of linguistic and cultural salvage and analysis remained closely allied with archaeology and museology, which explains how some of the most ambitious and important collaborative anthropological enterprises of the era—Franz Boas's Jesup North Pacific Expedition (1897–1902), for example—were organized principally around building natural history collections. As the twentieth century wore on, an individualistic model of field research came to predominate in American and European anthropology, at least normatively, and was celebrated for the transformative qualities of participant-observational immersion. But one would scarcely have had to scratch the surface of any ethnographer-informant dyad to illuminate the complex webs of social enablement—involving research assistants, translators, laborers, intermediaries, government agents—that made anthropological research in the classic Malinowskian mode possible.

After the Second World War, a new emphasis on interdisciplinary area studies research in the social sciences expanded and intensified anthropology's range of collaborative engagements around the world. Much as expedition-era anthropology was absorbed into colonial and imperial knowledge projects, the area studies era was imbricated with the national and international political dynamics of the Cold War. Governments sought to enroll anthropologists in military and intelligence operations across the world—Project Camelot being one of the most well known. However, anthropology was also broadening its epistemic ambitions and moving from cultural salvage projects toward a grappling with modernity and the complex cultural and social dynamics of cities, nations, and world systems. Interdisciplinary exchanges no doubt served to accelerate this shift. And 1950s enterprises like Cornell's Vicos project in Peru (creating a "laboratory for social change") or the MIT Modjokuto project in Indonesia (which gave Clifford and Hildred Geertz their first fieldwork opportunity) cultivated the kinds of long-term interdisciplinary research networks that influenced graduate training and pedagogy as well.[1]

The postwar period also saw an efflorescence of anthropological research partnerships mediated through marriage and other life partnerships. Margaret Mead and Gregory Bateson are a classic example, Margaret Mead and Ruth Benedict a more elusive but possibly more substantial one. Then came the Geertzes as well as June and Manning Nash, Marilyn and Andrew Strathern, Edith and Victor Turner, and Margery and Eric Wolf, followed later by Barbara and Dennis Tedlock, Michelle and Renato Rosaldo, Sally and Richard Price, and Jean and John Comaroff, among others. Anthropology has seen

many couples practice the crafts of research, teaching, and writing under at least a partly shared sense of identity, each navigating its own relational dynamics as well as the dominant masculinist heteronorms of the discipline and the university in the twentieth century.

Reacting to the still broader and more complex scale of post-1980s globalization and its social, economic, and environmental consequences, the twenty-first century has seen renewed interest in collaborative research partnerships. Three that have inspired our duograph in particular have been the Matsutake Worlds Research Group (Anna Tsing, Shiho Satsuka, Miyako Inoue, Michael Hathaway, Lieba Faier, and Timothy Choy), the Ethnographic Terminalia collective (Craig Campbell, Kate Hennessy, Fiona McDonald, Trudi Lynn Smith, and Stephanie Takaragawa), and the Anthropology of the World Trade Organization group (Marc Abélès, Máximo Badaró, Linda Dematteo, Paul Dima Ehongo, Jae Aileen Chung, Cai Hua, George Marcus, Mariella Pandolfi, and Phillip Rousseau).[2] All are multi-institutional and international partnerships that have explored new ways of creating anthropological knowledge by crossing the boundaries between anthropological research practices and the arts.

Collaboration itself is nothing new in anthropology; there is abundant evidence that it has been a productive dimension of anthropological research and writing since the discipline's beginning. Further, intimate research partnerships have long fueled the production of anthropological knowledge. There is doubtless an important book to be written about how the particular qualities, subjectivities, and dynamics of particular collaborations have influenced the kinds of knowing and knowledge that those enterprises generated. But our intervention here is more limited. We have found it striking that the spirit of collaborative research has not always translated well into practices of authorship. Coauthored texts remain the exception rather than the rule in anthropology, even when they derive from jointly undertaken field research.[3] The reasons for this gap are not simple and involve considerations ranging from professional reputation to relational dynamics to institutional audit cultures that seek to impose a mathematics of individual accomplishment and accountability on the sociality of research, analytic, and writing practices. What is striking in our view is that there are relatively few models for collaborative writing beyond the model of the jointly authored single text that synthesizes analytic perspectives under a common "we." This is why we have centered our methodological intervention on the duographic form: we are looking for ways to strike a better balance between individual ideation and expression and collaborative fieldwork and archiving.

An important added benefit of the duograph is that it permits a more extensive analytic division of labor between its volumes, as parallel yet distinct arguments can be developed with respect to the common research archive. In our case, the *Ecologics* volume's close focus on how human energetic and environmental aspirations intersect with other-than-human beings and agencies complements yet also reframes the *Energopolitics* volume's effort to offer a more nuanced and comprehensive set of analytics of (human) political power, and vice versa. If the general premise of the entire research project has been that a certain politics of energy is creating a situation of ecological emergency, then it is fitting, and we might say necessary, to be able to offer detailed conceptual and ethnographic accounts of both sides of the equation—energopolitical and ecological. Had we tried to compact all these storylines into a single, synthetic account, however, we might well have burst its seams or have been forced to simplify matters to the extent that neither side would have received its due. In the duographic form, meanwhile, two volumes working together in the mode of "collaborative analytics" can dive deeply into different dimensions of the research while still providing valuable ethnographic elaboration and conceptual infrastructure for each other.[4]

Your Turn

One of our favorite rationales for the duograph is what is happening right now: you are deciding where to start. True to the lateral media infrastructures and expectations of this era, we aspire to offer a more dialogic, collaborative matrix of encounter with anthropological writing. We have sought the words to write; you now seek the words to read. We have left signposts as to where we think the volumes intersect. But you can explore the duograph as you like, settling into the groove of one narrative or zigzagging between them. Think of it somewhere between a Choose Your Own Adventure book and open-world gameplay. Follow a character, human or otherwise; riddle through the knots and vectors of aeolian politics; get bogged down somewhere, maybe in the politics of land or the meaning of trucks; then zoom back out to think about the Anthropocene. Or perhaps pause for a minute or two to watch the birds and bats and turbines that now populate the istmeño sky.

Cymene Howe and Dominic Boyer

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Introduction

On many afternoons, it is the windiest place on earth.

Carving out the narrowed girth of southern Mexico, the Isthmus of Tehuantepec is home to a anemometric quality that is nearly unmatched. Wind is valuable here, its steady pulse an ideal quotient of kinetic force to turn the blades of turbines that, in turn, make electricity. With this wind development might follow; with this wind new wealth might follow. And these are two of the reasons why the Oaxacan isthmus now represents the densest concentration of wind parks on land anywhere in the world. But in this wind other things are also gathered and captured: birds and turtles, trucks and barricades, dirt and money.

This book began as a way to follow wind, and wind power, as a "salvational object": a social and technical apparatus to mitigate climate change in environmentally precarious times. How wind power was being located—epistemically, infrastructurally, and politically—were my abiding questions at first. However, what was initially an exercise in political economic reasoning or an accounting of resources and their manipulations, became something more. Across hundreds of conversations and thousands of hours of encounter, it became increasingly clear that energy transition is not the work of people alone. In questions of power, both energetic and political, people's aspirations and their cosmological views are crucial. But it is also the case that human actions can never disclose the full extent of how new energy forms are able to reassemble the lifeworlds of creatures, or how they can shape the potential of inanimate things. Concentrating only on the sociocultural dimensions of energy risks obscuring others, particularly how

the elemental force of wind, in itself, might become differently. Deeply political projects of renewable energy development and the rise of wind parks have come to occupy the Isthmus of Tehuantepec. Unequivocally. But coincident with this truth are others: biota and stones, machines and infrastructures, dust and air. It was in the wind itself that my attentions first became bent, because when it blows and when its velocity and pressure reach their apex, the wind insists that everything is much more than *anthropos*.

This book follows the wind, but it also describes an antidote to the Anthropocene—the epoch of human imprint upon all earth systems from the geologic to the biotic, from the chemospheric to the hydrological, and from the cryospheric to the atmospheric. As a concept, the Anthropocene hails a particular kind of encounter between deep time and human habit; it is meant to highlight a genealogy of consequences as well as presage precarious futures. Anthropogenic impacts from energy extraction, production, and use have surfaced the reciprocal relationships between excess and deprivation, and they have become harbingers for the unsustainable logics that have driven petromodernity.[1] The material forms and interactions that we call "energy" have always been harvested from what the industrialized world has named "the environment." But if the paradigm of the environment has sought to emphasize interdependencies and mutualities, the human-energy nexus has increasingly come to reveal the corrosive ways that people and energy sources interact. Widespread human demands to have energy at our disposal present a calculus between human aspirations for power, human attempts to manage the climate, and the vital possibilities of all creatures, plants, and beings.[2] Within the parallel worlds of energy and environment, it has become clear that although renewable energy transitions demand the adoption of less catastrophic fuel sources, equally critical is understanding how human energetic desires—for light and heat, for movement and flourishing—either correspond with or deeply disrupt the energetic needs of other biotic life and the systems on which we all depend.[3] Therefore, the argument that I develop throughout this book is that we cannot capture the contemporary dynamics of energy and environment without attending to an array of other-than-human relations including those with nonhuman beings, technomaterial artifacts, infrastructures, and geophysical forces.

By exploring the routes and passages between energies and environments, lives and machines, and the forces that compel them, I also want

to create a narrative patterning that is at once anticipatory and interruptive. An anticipatory approach is instructive in times that are marked by ecological discord because it attunes our attention to the subjunctive future of the might be.[4] In anticipation, prognoses float, undetermined but not unknown; questions are raised, but conclusions hang in suspension. Wind also enters here as an interruptive force, awakening air and rousing it from stillness. In following the wind, intermittencies find their way into these pages through things like birds and dust, dead dogs and trash, gusts and stillness. The architecture I have developed across the book is likewise anticipatory and interruptive; chapters oscillate back and forth between the contentious development of the massive Mareña Renovables wind park and the ways in which particular other-than-human forces and entities came to challenge that project.

Parallel to the case of Mareña Renovables, I devote attention to three distinct other-than-human actors in the saga of wind power: wind, trucks, and species. Each of these entities has had a profound role in the development of wind power. Strong and steady wind is, of course, a prerequisite for the development of wind power; it is elemental in the most literal way. But trucks, like wind, are also everywhere within wind power in the isthmus, moving men and materials and operating to create particular political outcomes. And in the places where wind power is being developed, there are also myriad species with those threatened by industrial-scale wind parks appearing in particularly stark forms.

While wind, trucks, and species all hold ethnographic resonance for the case of wind power in Oaxaca, each also provides an analytic for the scalar thinking that the Anthropocene demands. They mark temporal coordinates both past and future. Wind that blew centuries ago was a force that can be said to have partly inaugurated the Anthropocene. It was wind power, after all, that blew colonial exploration and imperial exploitation to the New World. In the mid-twentieth-century "Great Acceleration" of carbon use, trucks served as a mechanism to embody the work of fossil-fueled modernity. And finally, in the precarious future of Anthropocene conditions, there are species—the compendium of all known life hanging in the balance in an unbalanced world. Species includes flora and fauna as well as a future humanity, all of which now face uncertain geoenvironmental risks. Through knowing wind power more closely—in its elemental, technological, and more-than-human forms—my hope is to assemble ecologics differently and to look for a new, turbulent prototype.

How Wind Collapses, in the Future Subjunctive

We could begin anywhere on a continuum, tilting toward one position or the other, and find ourselves, ultimately, in a story of utter failure or a tale of extraordinary success. Here are two scenarios of how wind collapses in the future subjunctive.

SCENARIO 1

The Mareña Renovables wind park would have been the largest wind park in all Latin America.

It would have generated almost 400 megawatts of electricity, enough to power more than 600,000 Mexican homes. With the isthmus wind as its resource, the 132 turbines and their generators would have prevented almost 900,000 tons of carbon dioxide emissions every year for at least two, perhaps three, decades. Financed by a consortium of international investment programs—part Japanese, part Australian, and part Dutch—the Mareña park would have put millions of dollars into the hands of environmentally conscious investors, providing capital for sustainable infrastructure projects in the future. The companies that would have purchased the clean power from the park would have benefitted from receiving bonos de carbono *(carbon credits), offsetting their carbon footprint, and burnishing their profiles as socially responsible corporate enterprises. In the isthmus, jobs would have multiplied during the construction phase, giving work to unionized laborers from across southern Mexico. Local construction companies would have sold their goods. Once built, the project would have provided jobs in engineering, maintenance, and management. Indigenous communal landholders,* ikojts *(Huave) and* binnizá *(Zapotec) people, would have collected millions of pesos for the lease of their land. These funds, in the hands of farmers and fisherfolk, would have been invested in better homes, equipment, and education.*[5] *More things would have been bought. People would have been healthier and happier, and development would, at last, have arrived in the more remote regions of the isthmus. Roads would have been paved, streetlights would have appeared. Politicians and agencies of government would have been pleased. Mexico would have stood prouder, leading countries of the global South toward greener futures.*

The Mareña park, like many of the wind power projects now occupying the isthmus, would have had all of the signatures of success, including

immense amounts of transnational capital and unflinching state support. It would have been devoted to a new regime of energy that not only would have empowered Mexico but also would have lived as an energetic infrastructure to heal the world's wounded climate.[6] *But this would be a failure.*

SCENARIO 2

The Mareña Renovables wind park would have been the largest wind park in all Latin America.

It would have occupied seventy-three acres of territory, its ivory turbines arcing across a sliver of land between the Laguna Superior and the Laguna Inferior. The territory where it would have been erected is a biogeographically vulnerable place, a narrow sandbar, or barra. *This sandy stretch of land would have been asked to support 132 turbines, each one reaching 105 meters (thirty-two stories) into the sky and weighing 285 tons. The 132 towers of steel, many tons of cement, and 396 blades churning the air might have created quakes in the sand, sending tremors across the lagoons. Lights atop the turbines would have burned day and night, and fish, shrimp, and other seaborne life might have retreated and migrated, leaving local fisherfolk without their daily catch. The fish might never have returned. And local communities in San Dionisio del Mar, Álvaro Obregón, and Juchitán might never have fished again. Construction work would have displaced many tons of mud and earth, and the docking stations where steel and concrete would have been off-loaded would have forever changed the barra. Jobs constructing the park would have gone to outsiders, not to residents of the region. And the work that would have materialized for local laborers would have been brutish, short, and poorly paid. For the lease of their land, some would have become richer while others would not. Frictions would have endured. Corporate lawyers would have designed the contracts as "evergreen with right to cancel," meaning that landholders would have indentured their lands for decades. Automatic renewals on lease contracts would have come to feel very much like dispossession, or* despojo*—being robbed of one's land. Indigenous and campesinos' lands would appear, once again, to be vulnerable to the whims of the transnationals. Members of the* comuna *(communal estates), or* comuneros *(communal landholders), who originally signed contracts would feel that they had never been informed about the gargantuan size and impact of the park.*[7] *Wind power would cause strife*

and pitched battles between neighbors and within families across the isthmus. And in the communities surrounding the barra where the massive wind park would have been located, protests, blockades, vehicle heists, and raids by state police would carry on for years. Those who vocally spoke out against the works of the project would receive death threats and beatings. But with perseverance and strategies learned over decades of political unrest, protestors would ultimately stop the park's construction. It would be arrested and incapacitated. This would be a success.

The case of the Mareña park, in the scale of its potential and the enormity of its collapse, is an instance of one megaproject undone. But while the park has its singularity, it can also be taken as emblematic of programs of renewable energy that fail to deeply engage with and account for the people, things, and other beings that are coincident with them. The anticipatory good that the park was meant to bring, both for local development and for the energetic redemption of the global climate, existed as subjunctive futures: the might be, the could be. But that potential began to wither. It was not a series of technical flaws that presaged the giant wind park's denouement. Instead, its collapse was consecrated in the relationship between human hopes and an increasingly frail ecosystem. Wind power would have been a cleaner way to generate electricity, but the creators of the Mareña project failed to realize the ways in which their plan reproduced an extractive model in which "resources" are possessed and sold and the proceeds are divided, often in inequitable ways.

It has been the modus operandi of fossil-fueled modernity to extract resources in places that are relatively remote from the centers of consumption.[8] However, in mimicking the logics that have underwritten the carbon economy for the last three centuries, renewable energy transitions risk repeating old conventions that end in ruin. New ecoenergy forms ought to instead proceed with an ethos of rehabilitation rather than resource extraction. This should be an exercise in rebalancing human aspirations for energy with the energetic life needs of the more-than-human beings with whom we are in orbit. It ought to be a reckoning with forces like wind and water as well as an encounter with our technomaterial apparatuses. In truth, we cannot afford to get it wrong.

FIGURE INTRO.1. Wind turbines, Isthmus of Tehuantepec

Aeolian Arrivals

The power of electricity and green neoliberalism have converged in the isthmus, reshaping life in the region. Over sixteen months of fieldwork, our research team of two traveled to all the critical sites of wind power development in Oaxaca, from the isthmus where turbines were being sited to the country's capital where policy makers struggled to develop a program of energy transition that would be beneficial not only for the Mexican state but for the world's climate.[9] Our project became a practice of defamiliarizing "wind power" as a singular, technical, managed energy form, looking instead for the multiple ways that "aeolian politics" were gathering force. Aeolian politics—borrowing from the Spanish *energía eólica*, meaning electricity derived from wind power—emerged and evolved in many directions, from policy acts to the placement of bodies on barricades and from salvational winds to broken habitats. Aeolian conditions are everywhere in this work, expanding the term to mean many kinds of wind and their competing energies.

We set out to see what sorts of social impasses or collective victories were informing the terms of renewable energy futures. To do so meant understanding the positions of all involved, those commonly thought of as stakeholders. These were people living in the shadows of the turbines or on the threshold of a wind park yet to be born. And they were the land creatures and sea life inhabiting those same domains. They were renewable energy

company executives and representatives of the Federal Electricity Commission (CFE), Mexico's national electricity provider and sole grid operator. And they were environmental professionals tasked with protecting watersheds and environmental systems. They were officials at every level of governance from local representatives in the isthmus region to state policy makers in Oaxaca City to lawmakers in the country's capital. They were journalists and laborers, aspiring politicians and hard-boiled *caciques* (local bosses), truck drivers and fisherfolk. And they were those who lived in and with the wind. We spent many hours with activists who were opposed to the parks as well as those who applauded the arrival of the *eolicos* (turbines). Over the course of our work, we also spoke with many, many "regular" people about their thoughts on the wind parks, on development in Mexico, on Pemex (the state-owned petroleum company) and renewable energy, on climate change and transnational capital. These were people we encountered in the course of our days, who might not have seen themselves as implicated in the political sweep of wind power or renewable energy but who were, nonetheless, part of a greater aeolian politics.

We went to where the wind is in order to grasp how renewable energy forms were coming to occupy the global South. But we also went to where the oil is. Mexico continues to be a petrostate—in recent times it has been dependent upon oil revenue for 43 percent of its federal operating budget. With declining oil reserves, however, the country had suffered financially, with much of its economic lifeblood buried deep under water in the Bay of Campeche.[10] Some regions of the Mexican state, however, are rich with wind, and in the early part of the twenty-first century, the country's policy regime tilted optimistically toward the development of renewable energy infrastructures. In fact, Mexico was among the first countries in the developing world to institute comprehensive climate change legislation, earning the country international accolades from environmentalists and industrialists alike.[11] If we were seeking to understand the phenomena of energy, Earth and human habit, we found that conjunction in Mexico: bioplanetary effects and the multiple energies that have fueled them.

Corporate investment and state sponsorship inaugurated the development of wind resources in the Isthmus of Tehuantepec beginning in the mid-1990s when the first wind park, sponsored by the CFE, became operational in La Venta in 1994. By 2004 a full-scale study of the entire wind corridor, devised by the United States Renewable Energy Laboratory, provided evidence of the considerable wind power potential that the isthmus held. Much of the region's land was marked "excellent" for the

production of electricity.[12] During Felipe Calderón's presidency (2006–12), when the power of drug cartels soared and oil began to wane, a serious campaign began to develop the renewable energy sources of the isthmus. Although never compelled to do so through the Kyoto Protocol, new legislation in 2009 required that 35 percent of the nation's electricity come from noncarbon sources by 2024.[13] Lucrative incentives for private-public partnerships were created, and the Mexican wind power sector flourished. In 2008 there were only two parks, producing 84.9 megawatts of power in the isthmus. Four years later there were fifteen parks, producing more than 1,300 megawatts, making Mexico the second-biggest wind power producer in Latin America. By 2016 the wind energy infrastructure of the isthmus had expanded to twenty-nine parks with 2,360 megawatts of capacity, a 2,676 percent increase from the first years of operation. According to the Mexican Wind Energy Association, AMDEE,[14] Mexico's total installed wind power will reach 15,000 megawatts by 2020–22.[15] While these metrics are evidence of impressive and rapid growth in the wind corridor, they cannot begin to capture all the complexities of wind power. There is much more to it.

Staying with the Turbulence in Transitions

Wind power is not just any power.

It is a promissory force. Unlike mining, logging, or drilling for oil,[16] wind power generation is supposed to, in part, save the world. Infrastructural programs that claim to climatologically benefit the "greater good" hold a particular ethical ballast. Renewable energy projects would seem to righteously, and rightly, drown out the banal drone of greedy shareholders or demands for cheap fossil fuels. Wind power offers both redemption from dirty energy and, in places where wealth is sparse, the potential of economic salvation. But there is complexity all the way down. In many places in Latin American and elsewhere, denunciations against the environmentally destructive practices of fossil fuel extraction have now morphed into protests against projects marked by the ambiguous sign of "sustainability." Challenges have arisen as to whether local places are being sacrificed in the name of global climate salvation.[17] And yet resistance to anything that is environmentally "sustainable" or is a technology of "resilience" can be taken as suspect. From one vantage point, those opposing new-energy infrastructures can be accused of obstructing the future and gambling with unknown climatological

consequences that are still evolving. By this logic, if local populations of people, and others, become irreversibly disrupted in the transition process, then that is simply the price to be paid. The global stakes are so high, and correcting the planet's faltering temperature equilibrium looms as the sine qua non of the subjunctive future. And yet old practices of extraction and exploitation can easily inhabit new spaces of sustainability, preserving a status quo that continues to seek cheap resources and vast tracts of exploitable land. Energy transitions thus beg the question, What precisely is being sustained? And what is being maintained?

Scientific consensus has determined that carbon incineration needs to end, but transitions have proven to be ambivalent. They are at once anticipatory and unknown. Hope is gathered here, but caution is too. Distinct scales of ecological remedy—those tuned to "local" worries or, on the other hand, to "global" concerns—can be incommensurate, each focused on addressing particular kinds of distress and distinct vectors of contamination. By emphasizing benefits to planetary ecological systems, local ecosystems may be further imperiled; and yet in failing to ameliorate widespread global impacts, the entirety of the living world remains in jeopardy. Therefore, in order to take an ethical position that prioritizes future possibility, it is important that we attend to how the mechanisms of transition are being operationalized, precisely because they can create their own forms of harm for humans and others. Each increment of ecological care ought to be thought of and enacted as a composition toward a whole. So while there should be no argument about the superiority of wind over oil in terms of externalizations and environmental damage, the institutionalization of any new energy form should inspire questions before resolutions.[18] And it has.

As I earlier wrote, this book was meant to narrate an antidote to the Anthropocene. And in some ways, it still can, but not without hedging and equivocating as to whether human beings can rebalance a warped world and restore habitability.[19] The Anthropocene speaks of vulnerabilities and risks, not simply for particular creatures, plants, and persons, but in the aggregate and in the future. A growing awareness can be sensed in dramatic weather events, such as cyclones and superstorms, just as it can be read across mediascapes in reports of fatal heat waves and arable land becoming desert. Anthropogenically induced environmental precarity will not be felt the same everywhere by everyone; the consequences will be uneven. Nonetheless, people around the world are increasingly exposed to the direct material

and physical truths of ecological mutations and exaggerated weather forms. We are living it. And in this sense, the Anthropocene is not simply a geological designation for the human impact upon earth; it is a way of explicitly recognizing that impact. It is a state of consciousness.

As a planetary condition of precarity, the Anthropocene conjures a certain kind of extinctophilia, or an attunement to the necrotic. Each move that is made to chill the effects of a heating planet exists as an implicit recognition of human fragility.[20] Projects for sustainable energy that aim to mitigate further climate and biotic destruction are, in part, predicated upon the recognition that as a human species, we too are endangered. In ways like never before, "we" hang in the balance,[21] traveling the risky corridors of species being as the Anthropocene intensifies its effects. This means confronting extinction in new ways, that of other species and our own. But a state of impairment has a way of focusing attentions.[22] As Anna Tsing has described, life on a "damaged planet" is also a prerequisite for "livable collaborations," which are, in turn, the stuff of survival. If ruins are now our gardens and blasted landscapes compose the sites of our livelihoods, then we need to find optimism and perseverance in these ruins, in the cracks and fissures, in the spores and weeds.[23]

This is where wind comes in. Like the air out of which it is made, wind thrives on interplay with bodies, both lively and inert. An oscillation of gases and heat differentials, wind is an insistent reciprocal exchange between air, beings, and objects. Its relationality is important, even indexical. It is in contact that wind is seen. We might think of leaves quivering or branches undulating, dust in the air or a plastic bag aloft. In all cases, wind is seen only in those places where it touches or moves something else. A pencil drawing of curled lines is a way to illustrate wind, as are graphs, charts, and maps. But ultimately wind is only ever made visible through its impact and influence on other matter, other materials, and other things. Wind's ontology refuses to take separateness as an inherent feature of the world. Its relationality exists as an inverse allegory to the teleology of extraction that operates in one direction, to one end and for a singular purpose. And this is, in part, wind's value—it has an existential precondition that appears only in the context of contact. Wind is touching, mutual, moving.

In an era of renewable energy transitions, wind exists as a heuristic assemblage where powers and future imaginaries are tethered to one another. But wind also refuses to be gathered or to be caught as a thing; it cannot be held in a jar. Unlike other resources—such as water, land, or oil, wind evades

enclosure; it is nothing if it is not movement, and therefore it is a force that is not easily made into a propertied object. Placed in a box, its ontic state is fundamentally transformed, becoming air. It is a force that may be captured but never contained.[24] While wind's kinetic force may be seized by the blades of turbines, wind in itself cannot be held. It is elementally loose. It is motion. Even as wind may be inanimate, it is nothing if it is not animated.

In ecologies of relationships that survive and sometimes thrive in the gusting winds of the isthmus, I want to avoid drawing deep divisions between the ontological capacities of nature and society and instead find their useful recompositions.[25] There is no fetishization of nature, or Nature, here. In fact we might begin with the acknowledgement that "nature" (or for that matter "environment" or "ecology") now exceeds and overspills definition.[26] Attempting semantic jurisdiction over the terms of what *is* or *is not* natural or constitutive of *the* environment is a conceit best left in historical place, like in mid-twentieth-century theories that lavished attention upon such binaries.[27] As Marilyn Strathern predicted a few decades ago, somewhat prophetically, our epistemic climate has increasingly come to represent an epoch "after nature."[28] These kinds of dissolutions and temporal demarcations seek new, re-adaptive thinking.

If there ever was one, the "thin bright line" between people and the mystified category of nature appears to be increasingly dissolving. Jackrabbits and Nissans, sand dunes and electric current, turtle eggs and stunted corn crops now all occupy this side of history, a cohabitational zone of socionatural space. Many thinkers have begun to emphasize the importance of recognizing the coconstitution of human and nonhuman beings, or what Donna Haraway calls "making kin." As the demarcations between humans and nonhumans have increasingly crumbled, in rubble too is the contention that "natural" history can be disentangled from the history of "Man." From this, theses have emerged prompting questions as to how "human" human history really is or ever was.[29] Where we have singularized human activity and separated it from everything else, we have, in fact, failed to understand the evolution of modernity and globalization as processes of interaction between material forms and forces as well as among multiple species. Of course, the history of capital must likewise enter into this genealogy because it has conditioned lifeworlds the world over. In this context, it has become clear that the "social" in social theory needs to be reproportionalized, at least the "social" that has been bracketed as referring to exclusively human interrelationships.

An Anthropology Alive to the Anthropocene

Some have suggested that the Anthropocene is a remarkable and unique gift to the discipline of anthropology itself.[30] Both nominally and epistemologically, Anthropology has claimed to be *the* science of anthropos, and its practitioners have spent well over a century attempting to grasp the many ways of human being. However, anthropological work has likewise been keenly alert to the conditioned specificity of "nature," particularly as a code that seems to surface most dramatically within its putative inverse: modernity. The bimodal categories of nature/culture and environment/society have sparked debate and challenged normative assumptions in the discipline for many decades. Such juxtapositions, their theoretical generativity, and the recognition of their limits have roots in philosophical propositions. But perhaps more importantly, they have been gained through empirical wisdom. The people with whom many anthropologists have worked, historically and in the present, often claim no rigid, exclusive, categorical distinction between human living and the material and multispecies domains in which people and their others interact and thrive.[31] From this accumulated insight, an anthropological fascination with a posthuman condition, multispecies studies, or more-than-human encounters would seem to be a rather "natural" outcome for a discipline that has observed firsthand the refusal of nature as a singular form.[32]

If the trouble with nature has been an anthropological preoccupation, displacing a universal understanding of *the* human might qualify as an anthropological obsession. Illustrating difference across human experience while also narrating transparticular similarities has remained at the core of anthropological work. Anthropologists have spent many decades demonstrating that there is more than one way to be human, and so it would seem the next step is to think through how the more-than-human is equally part of that story. In the conjunction of human and more-than-human encounters, attention to material things and other species should also encourage us to take humans as a species: a species that has altered earth systems and a species that faces its own status as newly endangered. Put another way, in a human-contorted world, we ought to push toward deepening the groove in which cross-species intimacies or socialites are evolving. Perhaps we are now even obligated to work beyond the human, as no element of human life exists untouched by ecosystemic circumstance. Where nature is increasingly erupting through human lives and vice versa, to ignore the unhuman is to walk willfully blind into a time of vivid possibilities.

The infusion of the more-than-human into the science of anthropos has not come sui generis. It has developed together with correlates in the physical sciences, from biology to physics.[33] Science and technology studies have stressed the incorporation of agentive technologies, machines, and apparatuses into human being, and this perspective has been woven into the analytics I use here. Feminist epistemologies, in particular, have provided generative ground for multispecies studies and techniques of science and technology. Attention to cyborgs, for example, explicitly called for the machinic to meet the biological, frustrating an easy separation between natural and "man-made." In times of ecological instability, the biological itself can likewise be recognized as more permeable, or "transcorporeal," as Stacy Alaimo has put it.[34] In the conditions of the present, I am especially cautious of delimiting our intellectual method to a facile version of actor-networked forms of agency.[35] In order to understand our environmentally precarious form of late industrialism, as Kim Fortun has reminded us, we must be responsive to the material and social ontologies of toxic conditions and unlivable environments that are not fully captured in actor networks.[36] Where discursive approaches to meaning have operated to distribute nodes of power and their outcomes, thinkers such as Karen Barad have also insisted that physical substance (matter) must be given its due in the world's becoming.[37] Or perhaps many worlds' becoming.[38] As she has put it, "Matter matters as much as mattering"; the physical and the significant are inseparable.[39]

The call to name this age the *Anthropo*-cene may appear to some as the ultimate aggrandizement of an overbearing species that is now carving its name into an epoch: the Age of Man.[40] However, as we well know, the Anthropocene condition did not come about through all people equally but from the cumulative acts of certain people with particular powers, the great majority of them being men. Past times that have valorized particular kinds of male achievement established a reigning Age of Men that, in turn, produced the Anthropocene age. And while the accumulation of human hubris may remain underfoot in plasticized and carbon forms in planetary stratigraphy, we can also aim to refuse the spirit of anthropos's reign. If an Age of Men created the Anthropocene condition, it is now time to invert that logic. Response to ecosystemic precarity will need to come from everyone, everywhere; it is not that fault lies equally, because the global North bears the greatest blame, nor that solutions will be evenly executed, for the global South is facing the greatest scales of harm. There is risk in flattening species being into one grand humanity because it erases histories of exploitation and futures of unequal consequences. However, debates about the qualities, origins

and outcomes of the Anthropocene have invigorated questions about the place of the human in the world and the worlds that humans share with all other earthly life and things.

The Anthropocene may guide us to interrogate the consequences of a dominating anthropos; but, in truth, feminist thinking has always had that kind of attunement. The designation of an Anthropocene age invites a species reckoning to be sure, but it also summons gender trouble. This is a good thing. Old Cartesian distinctions that cleave human social and intellectual dispositions from their ecosystemic origins ought to continue to face critique. Equally important, however, is that the politics that have allowed for these sorts of inorganic fissures—which are almost always posed as natural—should likewise become part of a sedimented history of man that we leave behind.

That "anthropos"—as "Man"—resides so centrally within the notion of the Anthropocene is, in every way, an invitation to a feminist corrective; that corrective shapes the way I have written this book. Citational practice is one of the tools we have at hand as authors, and I use that prerogative intentionally here. While the scholarship in this book reflects a range of thinkers and disciplines, all of which are represented in the notes and bibliography, I prioritize feminist scholars of environment and ecological conditions in the text by using only their names in the body of the book. This is intended as a small counterbalance to the current politics of citation where male authors (often from the global North) continue to accrue more citational recognition, and thus legitimacy, particularly in the domain of theory. This is what Sara Ahmed has called "the citational relational." My intervention here is meant to acknowledge and surface a dynamic that unfortunately continues in the production of knowledge. This may be an imperfect experiment, but it is, from my point of view, a beginning.[41]

Fueling the Anthropocene

The Anthropocene speaks to the human manipulation of terrains, animals, and air. It calls attention to a process that has been ongoing and that may, in fact, singularize humans as a species. While people have always changed the land, creatures, and atmospheres where they have lived, we now live in times of exaggerated scale and depth. Humans grew up in the Holocene, an epoch that began almost twelve thousand years ago. It was in those conditions that we learned our agriculture and our letters, arriving at a state that we have

been inclined to call civilization or culture.[42] But if the physical sciences have begun to agree upon the traceable existence of anthropogenic impact on earth systems, there remains disagreement as to *when* this Age of Man began and *what* it was that initiated it.[43] Propositions regarding the onset of the Anthropocene range widely. It may have begun with the age of agriculture or with imperial expansion to the (so-called) New World or with fossil fuels or with nuclear fission.[44] Each has its logical origins and outcomes. Holding these differences in place, what remains consistent about the Anthropocene are three things: it is about time; it is about exploitation; and it is about fuel.

TIME

The suffix "-cene" is derived from the Greek *kainos,* meaning "new." But geological time is very slow and newness rare. And thus, the Anthropocene asks what it might mean to be *out of time*—chronically allochronic—incapable of imagining a seemingly boundless past, or an infinite future.[45] A new -cene might also attune us to what it might mean to be *out of time*—as in the jig is up and apocalypse is upon us. Distorted worlds may need troubled temporalities. And yet the Anthropocene continues in its accelerationist mode. Current extinctions are happening quickly.[46] We may worry about our own. These are times of prolepsis, where seeing a knife in the first act means knowing that the cut will certainly come. But we might also see a more hopeful foreshadowing here, where a grain of sand is a sign of a gem to come.

A fascination with Anthropocene causality and the periodizations of its unfolding is an indicator of one of the epoch's signature dynamics: bringing us deeper into our collective encounter with time.[47] The marriage of human history and geologic time is a call to the subjunctive form. We may recognize the future as both a lure and a tripping point because the Anthropocene is an anticipatory exercise. We know for certain that the skyscape is radically altered for millennia to come. *Geos* itself, with a seemingly infinite existence, embodies time that is deep and long. Temporal immanence like this can be cognitively challenging for those who live the fleeting existence of a human life-span. When Kathryn Yusoff writes that the Anthropocene is an opportunity to imagine ourselves "geologically,"[48] in the slow accretive metaphors of minerals and timescales in the hundreds of thousands or millions of years, she is correct. And yet in many ways we have already been living geologically. While the Anthropocene underscores how humans have become geologic agents the world over, our cohabitation with hydrocarbons

and fossil fuels—harvested from deep down in geos—are an indication that we have long been, if unconsciously, already living geologically.[49]

Times that are marked under the sign of the Anthropocene may simply mean that the difference between life (bios) and nonlife (geos) is now more assertively marked, even as it has always existed and been apparent to some and not others. In Elizabeth Povinelli's reading, this historical juncture is no longer a matter of life and death. Instead the "new drama" being staged is a form of death "that begins and ends in Nonlife." Extinctions far and wide expose anthropos as simply another installment in a grander collective of not only animal life but all "Life" as opposed to the state of "Nonlife."[50] Traveling far enough back in time, we find that it was geos that supplied the conditions of bios's becoming. It was an "inert" earth that gave birth to all life. Just as humans have engraved themselves in and on geos, so too has geos permeated humanity in various ways: molecularly and biopolitically. The Anthropocene is therefore not only a way to locate the sedimentation of human practice, it is an invitation to uncover how bios has always been interlocked with geos.

EXPLOITATION

The colonial affliction that began in the middle of the last millennium forever altered the movements of people, animals, and plants. Worlds were brought together in unprecedented ways, often brutal but sometimes benign. At each step, residual marks remained on the crust of the earth itself. Exploiting lands and people at scales that were heretofore unseen, imperial conquests and settler colonialism induced bouts of growth and withering. The transformation of forests and farms into private, enclosed plantations was often powered by enslaved human beings and their forced labor. As wild places were replaced with plantation monocropping, biotic abundance and panspecies habitats became denuded: contorted places to grow plants for profit. What began in the colonial era as the radical transformation of diverse kinds of human-managed farms, pastures, and forests is in the present exacerbated by agribusiness and industrial meat production, in what Anna Tsing and her colleagues have dubbed the "Plantationocene."[51] These biotic shifts may have multiplied in the fifteenth century, but those effects were intensified further in the long sixteenth century and the rise of capitalism.

While capital may be famously promiscuous, humanity on the whole cannot be assigned equal responsibility for the injurious channels that it has produced. Anthropogenic harms that have accrued under the figure of "the Capitalocene" are a combination of capital accumulation and the (human)

pursuit of power.[52] Operating in dialectical fashion, capitalism itself would become a world ecology enabled by changes in science, production, and the distribution of power. Capitalocene temporality, like that of the Plantationocene, resides in the extension of imperial seizures that engendered a restructuring of "natures" everywhere.[53] Plantations—and their close kindred in industrial agriculture—as well as capitalism continue to be at work in the here and now. As we recast history in the light of a deforming planet and climatological troubles, it is also vital to recognize that neither plantations nor capitalism nor industrial accelerations would have existed if it were not for anthropos. And that puts us back in the Anthropocene: a human-created epoch generating uncertain futures.

FUEL

The Anthropocene is often diagnosed as a plague of particular fuels and their burning. In the latter half of the eighteenth century, the European industrial revolution turned to new fuels and increased scales. Forests had been erased across much of Europe to sustain a growing population, but the machines of the industrial age required more efficient resources, and they were found in fossil fuels. The advent of the Anthropocene age can be traced, by some accounts, to one singular invention: James Watts's steam engine. This was the juggernaut of a peripatetic modernity, fed by coal that it would burn and burn and burn. Two hundred years later the industrial age reached its zenith and the mid-twentieth century would become marked as the age of more. Everything exponentialized: human populations, modifications to land masses, production and trade, excavations of petroleum pockets and mineral beds, the use of nuclear power for war and energy, and the emissions of gases and pollutants accompanying each increase in scale. They call these velocities of change the "Great Acceleration."[54] Speed and carbon formed an unprecedented coupling, and fuels became remainders residing in earth systems. Coal and oil, along with the split atomic nucleus, are the fuel forms that are most often associated with the Anthropocene and its accelerationist tendencies. But, I would argue, there is a critical other.

While petroleum certainly hastened anthropocenic conditions, we can also find the causal power of wind at work in the making of the Anthropocene. It was the power of wind that blew ships to the New World, inaugurating an age of imperial expansion and the increased exploitation of land and people, creatures and minerals. Wind-powered sailing ships transported goods back and forth, moving flora and fauna to disparate places, providing an aeolian infrastructure for the movement of people and things. It was

wind power and human greed that spurred the transatlantic slave trade. And through this set of abuses against anthropos came further intensifications of agriculture, continuations of displacement and the realignment of much of earth's matter. Wind that blew toward the New World led to certain kinds of futures. Captured within it, then and now, are other, potentially more equitable, possibilities.

Perhaps it is irrelevant to speculate on which time periods, social processes, or energetic sources can be charged with increasing ecological precarity. Does it matter, in the end, whether it was atoms or oil or wind at the root of it all? Maybe not. But maybe so. Unlike carbon fuels, wind has been positioned—by governments, industry, and environmental advocates alike—as a way to reverse the Anthropocene order. Therefore, while wind might be blamed for abetting the trouble on terra, it also embodies a response, a solution, or a method of energetic salvation. Wind thus holds us in an uncomfortable paradox: it exists as both partial cause and potential redemption for an anthropogenically wounded world.

This book is an attempt to live within that paradox by illustrating how wind fails when it is made to repeat the extractive logics that have sustained carbon modernity or, conversely, how it can succeed by giving its energetic potential not only as a source of power but as a source for imagining politics and ecologics anew.

THE FIRST CHAPTER OF this book is named for what it attempts to contain: "Wind." While elemental forces of air, water, earth, and sunlight have long maintained human and other life on the planet, they are now more broadly recognized as spheres that are at once crowded with extinctions as well as teeming with energetic potential. In this chapter, I engage with how wind is a dynamic and heterogeneous figure—a force of aeolian multiplicity—that is formed by land and by hope, by technocratic management and by human care. In this process, I argue, wind becomes differently, moving from element to condition and from experience to resource. Wind power itself can be said to occupy very different places in any map of the Anthropocene as a force that fueled the epoch as well as one intended to undo it. Wind's very ontology, therefore, calls for a "deterrestrializing" of thought, and what this chapter ultimately shows us is that wind cannot in fact be contained, only captured for a moment.

In "Wind Power, Anticipated," chapter 2, I track the evolution of wind power and its parks in the Isthmus of Tehuantepec. In this origin story is

embedded the developmental aspirations of those who promoted the growth of wind power as a renewable energy source. In its most dramatic utterances, wind power was anticipated as a salvational object with far-reaching benefits. Out of this calculus came the Mareña Renovables wind park, which would have been the largest single-phase wind park ever installed in Latin America. I take the case of Mareña as paradigmatic of the challenges facing wind power in Mexico and, by extension, elsewhere. For those who promoted the project, its creation held enormous ethical potential not only to generate great quantities of renewable electricity but to provide social and economic development to the region. For those who stood in opposition to the project, firm ethical ground also upheld them: rejecting corporate megaprojects and the industrialization of their environment. What I demonstrate in this chapter is that origins matter to outcomes.

Trucks, the subject of chapter 3, would seem to be an unlikely nonhuman collaborator in the development of renewable energy. Trucks embody petromodernity in almost every way, from their masculinist stereotyping to their fossil-fueled metabolism. However, in this chapter I show how trucks are fundamental to the evolution of wind power: compelling the process, physically, politically, and often affectively. In empirical terms, they are always at work in the construction of wind parks or transporting the material goods for their operations. Trucks literally drive wind power: in the men they transport, in the politics they create, and in the hopes and terrors they foment. Trucks enable mutual communication between matter and form. As a temporal marker, trucks also occupy the apex of Anthropocene accelerations, and trucks therefore serve as "indicator machines" as well as "transitional objects"—expressions of human and machinic interplay that lie between petromodernity and a renewable future. This chapter makes the argument that technomaterial tools, objects, or artifacts, such as trucks, need to be taken as (a) consequential "matter" in understanding the ecosocial politics of energy transition.

In chapter 4, "Wind Power, Interrupted," I navigate the second part of the story of the wind park that never was. Although bolstered by powerful allies and drawing from all the forces of governmentality, developmentalism, and transnational capital, the Mareña project found itself irretrievably interrupted by accusations of trampling indigenous sovereignty and endangering other-than-human lifeworlds. For many supporters of the wind park, criticism of it was motivated by desires for personal financial gain. But for those opposed to the park, its collapse was a resounding victory against domination and displacement. Mediated across international news outlets

and echoing through the channels of the Mexican nation-state, the Mareña project became a paradigmatic case, as one government official put it, "of how it should not be done." This chapter details those impasses to show that while the project may have intended to bring "transition" to the region—in the form of renewable energy and economic development—those protesting the park saw no such transition. Opposition to the project ultimately shaped a philosophical critique as to whether renewable energy is really anything "new" at all, especially when seen from the point of view of centuries of domination and militant responses to that domination. I argue that in the end, transition is nowhere an objective or neutral process but one predicated on subjective positioning.

Chapter 5, "Species," is an invitation to unthink species as a classificatory system of categorization and to instead *be with* species. In this chapter, human expressions of displacement—like fears about the loss of land and territory—find their analog in other species' displacements: from jackrabbits to sea turtles. Species life in the isthmus is qualified differently in the context of anthropocenic conditions and this is consequential to how humans diagnose, quantify, and seek to manage the species life that is wrapped up in wind. Humans are a powerful species within the figure of the wind: calculating measures of "environmental risk" in the offices of government agencies and making claims about which humans, animals, or plants should be allowed to thrive or die in the isthmus. The feminist philosopher Isabelle Stengers has called attention to the value scales associated with animal testing, and I similarly take species in the Anthropocene as a particular form of animal testing: trials for both human and nonhuman lives that currently hang in biotic balance.

In chapter 6, "Wind, in Suspension," Mareña's fate is sealed. Through the rise and demise of what would have been the largest wind park in Latin America, it becomes clear that the project suffered no technoscientific undoing but was instead sacrificed to the play of suspicions. Proponents of the park saw opposition to it as the work of troublemaking outsiders and political opportunists preying upon green capitalist enterprises, extracting bribes and mounting protests to enhance their own financial and political networks. For those opposing the park, its supporters were equally suspect: interested only in their profit margins, in the form of rents and contracts, and abetting the extraction of resources in a place keenly attuned to the privations of transnational capital. The giant wind park was conceived in the paradigm that its global climatological good would correspond with the ecological, economic, and social worlds that comprise human and other-than-human life

across the isthmus. But as I show, failures of attunement ran deep: histories of insurrection and displacement were not given their due, and perhaps more important, the imagined futures of local residents were fatally ignored. While the wind park's destiny was tied to all manner of political maneuvers by caciques and corporate representatives, ultimately wind power would be drowned in the watery spaces between people and fish.

The conclusion to *Wind and Power in the Anthropocene* is a joint reflection on the collaborative research that is detailed in each of the volumes of the duograph, *Ecologics* and *Energopolitics*. In our final chapter, we look toward aeolian futures through the turbulent present of aeolian politics. In revisiting the years of research and analysis invested in this project, we return to the original premise that compelled us to the field, and to Oaxaca in the first instance: namely, the global necessity of adopting less catastrophic fuel sources in order to avert further anthropogenic harm and climatological insecurity. In revisiting this work, we also affirm more strongly than ever that renewable energy transition must be undertaken in a more fulsome way than it generally has been and that it must include the contingencies of both anthropolitical concerns and the more-than-human lives that energy infrastructures touch. Transition, we find, fails to achieve its potential when it is muted by the logics of extraction that have ruled the last several centuries. In the end, we do not merely need new energy sources to unmake the Anthropocene; we need to put those new energy sources toward creating politics and ecologics that do not repeat the expenditures, inequalities, and exclusions of the past.

Notes

JOINT PREFACE

1. See Lynch 1982; Price 2016.

2. For more information on these partnerships, see Ethnographic Terminalia, http://ethnographicterminalia.org; "Anthropology of the World Trade Organization," Institut interdisciplinaire d'anthropologie du contemporain, February 12, 2008, http://www.iiac.cnrs.fr/article1249.html.

3. But here, as in other respects, we find the aforementioned collaborative partnerships trailblazing. See, for example, Matsutake Worlds Research Group 2009; the exhibition catalogs and zines produced by Ethnographic Terminalia, http://ethnographicterminalia.org/about/publications; Abélès 2011.

4. See, for example, Boyer and Marcus, forthcoming.

INTRODUCTION

1. For anthropological and other social scientific approaches to the study of energy, see, for example, Boyer 2014; Daggett 2019; Howe 2014, 2015a, 2015b; Howe and Boyer 2016; Howe, Boyer, and Barrera 2015; Hughes 2017; Krauss 2010; Love and Garwood 2011; Mason and Stoilkova 2012; Nadaï 2007; Nader and Beckerman 1978; Nader 2004, 2010; Pasqualetti 2011a, 2011b; Pinkus 2016; Scheer 2004; Strauss, Love, and Rupp 2013; Watts 2019; White 1943; Wilhite 2005; Winther 2008; Winthereik 2018; Wolsink 2007.

2. Throughout this text I use the terms "we" and "our" with different intentions that I believe the reader will find clear in context. In some instances, "we" (or "our" or "us") is in reference to the collaborative research team of two. At other times, the "we" refers to those of you who are reading this text and therefore engaging in a conversation about the issues that are included here. And finally, there are instances where "we" is meant to speak of and to a grander category of human beings. The latter usage of "we/our" is clearly universalizing in some ways, indexing "all of humanity."

However, my intention is not to presume that all humans are equally positioned to act or respond to the environmental dilemmas that are the context for this project nor to suggest that all people—past, present, or future—are their root causes. Instead, I want to draw attention to humans as a species that has, through some of its agents over time, manipulated earth systems and "resources" to the point where it is now unclear whether a collective human effort will be able to control the environmental consequences that have come from carbon incineration and other earth-altering practices. Above all I want to emphasize that "we" is always a heterogeneous human.

3. For anthropological work on global warming, climate models, climate politics, and climate impacts, see Barnes et. al. 2013; Crate and Nuttall 2009; Edwards 2013; Henning 2005; Hulme 2011; Klein 2015; Lahsen 2005; McNeish and Logan 2012; Monbiot 2009; Oreskes and Conway 2011; Rhoades, Zapata, and Aragundy 2008; Roncoli, Crane, and Orlove 2009; Strauss and Orlove 2003.

4. By "subjunctive future" I resort to a (rarely used) grammatical form, the future subjunctive (available in Spanish and other language systems) to indicate what might be or that which could be were a certain set of predecessor events and qualities to unfold prior to that future moment being indicated: a hypothetical future action. In contemporary usage, the future subjunctive has been subsumed into the present subjunctive and appears only rarely (for instance, in literary or legal documents). However, here I want to underline both the future (temporality) and the subjunctive (possibility). I contrast this with Kim Fortun's "future anterior" (2001, 353). For Fortun, the future anterior is a formula for prefiguring the future by assessing the past (and thus aspiring to a better and better-understood future), whereas the future subjunctive is less sensitive to the past than it is to the present-cum-future.

5. I use the term "fisherfolk" to designate both those who actively fish and those who process and vend the fished products. We never encountered a fisherwoman in the isthmus during our research, though women were very involved in fishing as a livelihood. The *séptima* neighborhood—a working-class barrio where many Juchitecan fisherfolk live—is buzzing with women cleaning, drying, and selling fish in the predawn morning.

6. Social scientific work on infrastructures has been burgeoning. See, for example, Anand 2017; Appel 2012; Barnes 2014; Bowker et al. 2010; Carse 2014; Gupta 2015; Harvey and Knox 2015; Howe, Lockrem et al. 2015; Larkin 2013.

7. Beyond privately owned parcels of land, two forms of land tenure serve as important social forms in the isthmus and in Oaxaca more generally—*bienes ejidales* (or ejidos) and *bienes comunales* (or *comunas*, *comunidades*). Ejidos, a product of the Mexican Revolution, allow mestizo peasant farmers to collectively maintain and manage a communal estate, usually for the purposes of farming; members are referred to as *ejidatarios*. In the 1990s ejido collectives were able (and sometimes encouraged) to privatize land parcels, converting them into private properties with deeded owners. Bienes comunales are likewise collectively managed communal estates, but they are recognized as having belonged historically to indigenous peoples, gathered together as an *asamblea* or *comuna*; members are referred to as *comuneros*. Bienes comunales maintain a governing structure that calls upon the community's overall

membership (the asamblea) to vote in matters of land disposition. The commissariat (*comisariado*)—composed of a president, secretary, and treasurer—is charged with the administration of proper procedures and decision making, and they are in turn supervised by a *consejo de vigilancia* (oversight committee), comprising three comuna members, with elections taking place every three years. For more on ejidos and bienes comunales, see Cornelius and Myhre 1998; Castellanos 2010.

8. Remoteness is, of course, relative. For those communities being impacted by the extraction of fossil fuels and those laborers who work in the industry, extraction can be intimately felt on a daily basis.

9. This research was a collaborative project with Dominic Boyer—beginning in 2009 and concluding in 2013—that investigated the political and ecological dynamics of wind power development in Oaxaca, Mexico. For more on collaborative analytics in anthropology see Marcus 2018 and on authoring and writing in anthropology see Wulff 2017.

10. In 2013 the Mexican state undertook energy reform measures, revising its seven-decade-long commitment to nationalized oil production and ending Pemex's role as the sole owner and operator of the country's fossil fuel assets. In spring 2017 an Italian company was the first international operator to drill in Mexican waters, and it is expected that oil production will increase in the coming years. On Mexican energy reform, see the International Energy Agency report, "Mexico Energy Outlook."

11. See Booth 2010, for example.

12. On wind resources in the isthmus, see Almeyra and Alfonso Romero 2004; Alonso Serna 2014; Aiello et al. 1983; Borja Díaz, Jaramillo Salgado, and Mimiaga Sosa 2005; Caldera Muñoz and Saldaña Flores 1986; Elliott et al. 2003; Hoffman 2012; Sánchez Casanova 2012.

13. In June 2016 the US, Canada, and Mexico agreed that they would jointly commit to 50 percent noncarbon fuel sources (for electricity generation) by 2025; this represents a significant upscaling of Mexico's original formulation. Note that "clean" energy sources in this context include not just renewables but also nuclear energy, carbon capture and storage plants, and energy efficiency. Under that definition, 37 percent of North America's electricity in 2015 came from clean energy sources (Eilperin and Dennis 2016). Just 22 percent of Mexico's electricity generation in 2014 came from nonfossil fuels, according to its government, though the country has pledged to raise that to 34 percent by 2024.

14. La Asociación Mexicana de Energía Eólica, A. C.

15. The number of Mexican households that could be served by this quantity of wind-powered electricity is difficult to predict. Calculations of household electricity are complex and contingent on several factors. Electricity demands differ from state to state according to climate, habits, and installed devices. For one study of both urban and nonurban households in Mexico derived from the Encuesta Nacional de Ingresos y Gastos de los Hogares 2008 (ENIGH), see Cruz Islas 2013, 198.

16. Or, for that matter, any other environmentally disruptive extractive practices exercised in the name of modernity and growth. See Bebbington 2009; Galeano 1997; Gudynas 2009; Johnson, Dawson, and Madsen 2007; Liffman 2017; Turner 1995;

among others. On waste see, for example, Alexander and Sanchez 2018; Alexander and Reno 2012; Gabrys 2013. On the petropolitics of oil and its afterlife specifically, see Behrends, Reyna, and Schlee 2011; Breglia 2013 (Mexico); Coronil 1997 (Venezuela); Klieman 2008 (historic, Congo); Sawyer 2004 (Ecuador); Mitchell 2011.

17. This can also be taken as a sign of cynical reason, or what Peter Sloterdijk (2014) calls "enlightened false consciousness": people are equipped with knowledge but refuse to act accordingly.

18. For examples of oil and crises, see Bini and Garavini 2016; Dietrich 2008; Mitchell 2011; Love 2008. However, from my point of view, questions of energy transition in the Anthropocene provide a deeper impetus to enact and live energy/environment "otherwise." The environmental precarity of the present—in its global sweep and interlinked ecocrises of melt, seawater rise, and climatological decay/precariousness that are scientifically proven—suggests a unique condition for energy as well as encounters with and articulations of environment.

19. Changing our collective forms of energy is, from my point of view, an unqualified necessity, and this book is certainly not an argument against renewable energy nor against wind power as an important node of that apparatus. The question, rather, is how transitions can be undertaken with more care and attention to potential harm than has often been the case in the past.

20. Kathryn Yusoff describes this potential as the "extinguishment of the late Holocene human subject" (2016, 5).

21. Again, I want to bracket the grand human "we" here in the recognition that not all humans have contributed equally to, nor will suffer equally with, anthropogenically induced changes to the earth system (see Davis 2010 for an excellent, related discussion). There has been a tendency, in discussions about the Anthropocene, to imagine "future humanity" as a way to erase contemporary social differences and inequalities, including climate racism, as Kathryn Yusoff has pointed out (2016, 2). I do not want to rehearse that elision here, but I do want to focus on modulating the false separation of human and nonhuman survival and extinctions.

22. See, for example, Scranton 2015.

23. Humans as a "weedy species" (Wake and Vredenburg 2008) seems to be a more and more resonant designation, especially in the context of "ruins" and "blasted landscapes."

24. Wind machines (to test aerodynamics, for example) or fans (for cooling) are instances of human-generated wind, but their fundamental property continues to be (gaseous) movement and interaction. Unlike solid (minerals, coal), liquid (water), or viscous (oil) resources, wind is only generative when it is in motion. It is contrastatic.

25. The ecology of relationships builds from Descola 2013a, 5. In seeking to avoid a strict division between ontological and phenomenological being, I am thinking of productive pairings of the two. See, for example, Bennett 2010; Braun and Whatmore 2010; Chen 2012; Descola 2013a, 2013b; Jasanoff 2010; Massumi 2009.

26. For a range of more recent interpretations as to what constitutes "Nature's" end or its radical reformulation, see, for example, McKibben 1989; Latour 2004a.

27. Claude Lévi-Strauss and allied structuralists come to mind, but the human sciences have been in a more protracted discussion over the definitional qualities of nature/culture for far longer.

28. See, for example, Strathern 1980, 1992.

29. See for example Dipesh Chakrabarty's influential 2009 essay, "The Climate of History: Four Theses." His theses are (1) "anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction between natural history and human history"; (2) "the idea of the Anthropocene, the new geological epoch when humans exist as a geological force, severely qualifies humanist histories of modernity/globalization"; (3) "the geological hypothesis regarding the Anthropocene requires us to put global histories of capital in conversation with the species history of humans"; (4) "the cross-hatching of species history and the history of capital is a process of probing the limits of historical understanding." For further perspectives on the Anthropocene, see, for example Steffen, Crutzen, and McNeill 2007; Steffen et al. 2015.

30. In his 2014 distinguished lecture delivered at the American Anthropological Association meeting, Bruno Latour saw the advent of the Anthropocene, and scholarly work on it (1) to focus upon "human agency" as its central tenet, (2) to explicitly conjoin the "physical" and "social" sciences, and (3) to raise moral questions of responsibility (or as Haraway would have it, response-ability), all of which anthropology has been doing all along (Latour 2014, 2–4).

31. In fact, it would be impossible to narrate a history of anthropology without accounting for the significant role of nonhuman animals in ethnographic work from the inception of the discipline to the present. Early examples include Lewis Henry Morgan (1868) on the American beaver (a more naturalist account) or his account of Iroquois phratries (wolf, bear, and turtle, for example) and Boas's research on seal-hunting practices among Inuit peoples on Baffin Island (1883). While some human/nonhuman animal encounters are described in more programmatic terms (such as hunting), anthropology has represented a wide range of animal-human lifeways. Think of Cushing and Benedict on Zuni animal tricksters, Mauss's (1979) explicit ecological frame for his "social morphology" hypothesis, or Rappaport's (1968) deeper ecological approach concerning humans and their eco/animal. Douglas's 1957 discussion of human/animal relations among Lele peoples, for one, presages many contemporary discussions of human/nonhuman relationality. She writes that for Lele, one of the defining principles of animals is "their own acceptance of their own sphere in the natural order. . . . Most run away from the hunter, . . . but sometimes there are individual animals which, contrary to the habit of their kind, disregard the boundary between humans and themselves. Such a deviation from characteristically animal behavior shows them to be not entirely animal, but partly human" (1957, 48–49).

32. Social scientists concerned with other-than-human life as well as those committed to more deeply investigating the ways that inanimate materials shape human (or nonhuman) beings are many and growing. See, for example, Alaimo and Hekman 2008; Candea 2013; Coole and Frost 2010; de la Cadena 2015; Franklin 2007; Hartigan

2015, 2017; Hird 2009; Kirksey 2014; Kohn 2013; Lowe 2010; Myers 2016; Nadasdy 2007; Nading 2012; Paxson 2008; Porter 2013; Raffles 2010; Stengers 2010; Stewart 2011; Tsing 2012, 2015. In the humanities, see Wolfe 2009 among others.

33. For biology, see, for example, the paradigm-altering biological research of Lynn Margulis (1970); John Hartigan's excellent work on genomics, science, and racism in Mexico (2013). Regarding physics, Karen Barad, a theoretical physicist and feminist philosopher, develops the concept of "agential realism," which serves as an epistemological and ontological framework to center on the nature(s) of materiality and those relationships to discursive forms. The intention is to reform both "agency" and "realism," to underscore how human and nonhuman factors intervene in how knowledge is produced. In other terms, agential realism tries to move beyond the usual dyadic interpretation that distinguishes between social constructivism and conventional forms of realism (2003). Thus, agency, for Barad, "is a matter of intra-acting; an enactment, not something that someone or some-thing has."

34. See Alaimo 2010, 2016. Also see Haraway 1996.

35. The literature on actor-network theory is too massive to fully include here. However, for a comprehensive, chronological list of ANT texts and responses, see "ANT Resource," Centre for Science Studies, Department of Sociology, Lancaster University, http://www.lancaster.ac.uk/fass/centres/css/ant/ant.htm, last updated 2000.

36. Kim Fortun warns, for example, of what she calls the "Latour effect" in anthropology and science studies: that is, a singular focus on practices of expertise and actor networks in late industrialism that does not account for the material and social matrix of the toxic and inhospitable environments that make up people's lives today (2014).

37. See Barad 2003, 806–7.

38. On "worlds" and "worlding," see, for example, de la Cadena 2015; Viveiros de Castro 1998.

39. In "Posthumanist Performativity," Barad (2003) is responding to theorists of performativity, in this case Judith Butler, but by extension a whole oeuvre of post-structuralist work on discourse and the hailing of iterative linguistic performance that has derived (largely) from the work of linguist J. L. Austin.

40. Many alternative designations for our current age have been proposed in recent years: "Eurocene" (Grove 2016); "#Misanthropocene" (Clover and Spahr 2014); "Naufragocene" (Mentz 2015); and perhaps best known (currently), Donna Haraway's "Chthulucene," a period of "collaborative work and play with other terrans," where "flourishing occurs across assemblages of intra-active multispecies life, that includes more-than-human, other-than-human, inhuman, and human-as-humus" (2015).

41. See Strong et al. n.d. for citation practices and female authorship in cultural anthropology.

42. Compare to Tim Morton's "agrilogistics" (2016), which locates roots of the Anthropocene in the advent of agriculture and its material and ideological force beginning about ten thousand years ago. The Plantationocene indexes a more recent period of colonial expansion and its continuing effects.

43. In 2016, after seven years of study, an eminent group of scientists and scholars called The Anthropocene Working Group—composed of geologists, engineers, paleobiologists, geographers, historians, and philosophers among others—declared that the

world had entered a new geological epoch called the "Age of Man." The panel reported that biospheres, lithospheres, hydrospheres, cryospheres, and atmospheres everywhere on earth contained the imprint of human activity, including radioactive debris, plastic tides, displaced soil, and increased methane and carbon dioxide.

44. For a useful overview of Anthropocene "sources," see, for example, Bonneuil and Fressoz 2016.

45. Allochronic time occurs in a different geologic time. Anthropology itself has struggled with such allochronicities, namely the mistranslation of space into time. As Johannes Fabian (1983) has famously pointed out, the discipline has crafted reports that deny the coevalness between the ethnographic subject and her ethnographer. "Savages" could be temporally displaced, cast back in time as primitives, their worlds made static, largely because of their remoteness from "civilization." Fabian's formulation of allochronic, asynchronous time in the context of the Anthropocene may be worth revisiting as a way of recalibrating human time into geologic sync with nonhuman materials and beings.

46. See, for example, Kolbert's *The Sixth Great Extinction* (2014).

47. An emphasis upon periodizations of the Anthropocene also speaks to Chakrabarty's (2009) theses where historical time frames, or periodizations, that separate human from natural history come under critique. Or we can think about Tim Morton's admonition that while the Anthropocene time line may be "fuzzy" (Was it the advent of agriculture? Was it the industrial revolution? Was it the Great Acceleration?), we can nevertheless find an operative set of coordinates, for it is clear that it did not start 1.3 million years ago (2013; 2016).

48. Yusoff (2013a, 781) writes that in the Anthropocene, with humans as geomorphic agents, "new understandings of time, matter, and agency" accrue for the human as "a collective being." Through the immersion of humanity in geologic time, she suggests a move away from (simply) biological life courses to instead "a remineralisation of the origins of the human" as well as a shift in human time scales to stretch toward the horizons of the epochal and species lifescapes.

49. See, for example, LeMenager 2014; Zalasiewicz 2012.

50. Povinelli 2016, 8–9. In *Geontologies*, Beth Povinelli makes the argument that "geontologies" have long been here with (and of) "us" but that the conditions of the Anthropocene may be surfacing that fact to some human beings (often settler-colonialist societies), whereas many indigenous peoples, like those who have become Karrabing, have in fact recognized this ontological reality all along (see especially chapter 2). The separation of life and nonlife, she goes on to state, is also a technique of settler colonialism that has historically been used to debase indigenous ontologies and cosmologies that take nonlife beings as sentient. See also de la Cadena 2015.

51. The term "Plantationocene" emerged from conversations at the University of Aarhus in October 2014—in the AURA program (Aarhus University Research on the Anthropocene)—where participants collectively generated the concept for the traumatic changes seen in human-tended farms, pastures, forests, and finally, enclosed plantations predicated on private property and reliant on slave labor and other forms of exploited, alienated, and usually spatially transported labor. See "Publications,"

AURA: Aarhus University Research on the Anthropocene, http://anthropocene.au.dk/publications/, updated October 26, 2010.

52. "Capitalocene" is a term attributed to Andreas Malm (2015) and Jason W. Moore (2016, 2017), who locate the rise of capitalist society in the year 1450, corresponding with the European formation of capitalism. This dating also places the Capitalocene in historical parallel with Anthropocene theories that emphasize colonial expansion as fundamental to the epoch's formation. The designation Capitalocene is meant to dislodge the industrial revolution as the primary impetus for anthropocenic changes. However, it is also important to note that the industrial revolution initiates a new "means of production" (in a Marxist sense), which takes place within a capitalist "mode of production," and thus represents a specific form of capitalist accumulation. To eschew the importance of that late nineteenth-century moment (the rise of industrialism) and how it convened capitalism and the environment in very specific ways would be a mistake. In other words, the operations of capital and industrialism cannot, at this point in time, be analytically separate. However, I do agree with Moore, and with Isabelle Stengers (2015) as well, that Anthropocene discourse, and perhaps intervention, risks becoming neo-Malthusianism (often as depopulation rhetoric), too technophilic (as in, "we can engineer our way out of this"), and can become a set of tropes that overlook inequalities. Finally, while Capitalocene proponents find capitalism as the primary force driving toward ecological degradation, it is also true that we continue to live with emissions from the (former) noncapitalist world (e.g., the USSR and China under actually existing socialism).

53. Alternatively, the Anthropocene can be seen as crystallizing capitalism with nature. See Swyngedouw 2010.

54. I thank Kalyanakrishnan Sivaramakrishnan for the phrasing "velocities of change," which he proposed during our seminar in the Yale MacMillan Agrarian Studies program. See Steffen et al. 2015 on the Great Acceleration.

1. WIND

1. See Barad 2007 on intrarelations; Ingold 2007 on touching "in" wind.

2. Both "aeolian" and "eólica" draw their etymology from Aeolis. I want to signal that link and also underscore the linguistic relationship between the terms used in Mexico and "the aeolian" as a concept. *Los eólicos* is the Spanish term commonly used in Oaxaca to designate wind park developments (or the turbines themselves), and wind-generated electricity is *energía eólica*. Resistance to the proliferation of wind parks is commonly known as the antieólico struggle.

3. See the introduction to "Life above Earth" (Howe 2015a).

4. See Harvey and Knox 2015, 6–15, on how roads (or in this case, roads transformed into streets) are spaces of projection and material transformation where we can observe a negotiation between generic and specific forms of knowledge. Copaving by government and corporate entities in La Ventosa reflects a similar concentration of specialized knowledges and expert intervention. See also Dalakoglou and Harvey 2012; Masquelier 2002.