

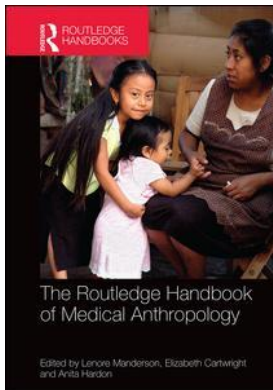
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Haitian Mother Preparing Food, 2012. Port-Au-Prince, Haiti.
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About the photograph

I took the picture in May 2012 in a displacement camp in Port-Au-Prince, Haiti, where thousands of people had moved after the January 2010 earthquake. More than two years later, in a makeshift tent more permanent than what displaced people may have wished, a smiling young woman stands out. She and her two young children were surrounded by their meager belongings. The image attempts to dignify her existence, despite conditions of extreme poverty, and reflects the resilience needed to survive in the midst of harsh circumstances. After all, they survived the earthquake. Yet, unintentionally, she contributes to the vicious cycle of deforestation, devastating floods caused by hurricanes, and more poverty. Charcoal, the culprit fuel, hidden under pots and pans and her only means to cook, is the result of scarce trees burned down for barter or cash in a land that becomes less fertile with time, but was once as green as its Dominican neighbor.

—Arachu Castro

The Anthropocene

*Elizabeth Cartwright, Lenore Manderson
and Anita Hardon*

The environment is a major player in human health. It's not just the backdrop to what we are doing during our busy daily routines, but it is an important contributor to the way that our physical bodies function; the quality of the food we eat, the air we breathe and the water that we drink are all predicated on the quality of the environment in which we live. In this chapter, we switch our focus to thinking about the environment, how it has changed over the past few hundred years, and how those changes have real ramifications for the functioning of our human bodies. The term 'Anthropocene' was coined by an ecologist (Eugene Stoermer) and an atmospheric chemist (Paul Crutzen) as a way to describe the "influence of human behavior on the earth's atmosphere, lithosphere, and hydrosphere in recent centuries" (Haraway 2015a: 258). The ways in which people have altered the earth, down to its very core, will be read as a time of ecological collapse and destruction that will be written into the earth's geology, according to these scientists. Other scientists, in a number of disciplines including anthropology, have picked up the use of this term, each time nuancing its definition to fit the purview of their academic interests. Bruno Latour, in his Presidential Address to the American Anthropology Association, argued the term gives "another definition of time, it re-describes what it is to stand in space, and it reshuffles what it means to be entangled within animated agencies" (2014: 16). Donna Haraway has discussed the strengths of the concept of the Anthropocene as well as a more precise term that she puts forth, the 'Capitalocene' (Haraway 2015a; 2015b).

It (The Anthropocene) would probably be better named the Capitalocene, if one wanted a single word. The mass extinction events are related to the resourcing of the earth for commodity production, the resourcing of everything on the earth, most certainly including people, and everything that lives and crawls and dies and everything that is in the rocks and under the rocks. We live in the third great age of carbon, in which we are witnessing the extraction of the last possible calorie of carbon out of the deep earth by the most destructive technologies imaginable, of which fracking is only the tip of the (melting) iceberg. Watch what's going on in the Arctic as the sea ice melts and the nations line up their war and mining ships for the extraction of the last calorie of carbon-based fuels from under the northern oceans. To call it the Anthropocene misses all of that; it treats it as if it's a species act. Well, it isn't a species act. So, if I had to have a single word I would call it the Capitalocene.

(Haraway 2015a: 259)

The terms ‘Anthropocene’ and ‘Capitalocene’ help us to conceptualize the massive environmental changes that are occurring on our planet. In this chapter, we contextualize human health threats within this rapidly changing environment. As Merrill Singer puts it, “Given the demonstrated ability of life forms to thrive under extreme ecological conditions, what is at stake is not life per se or even the planet, but life as we know it, including the historic life of our species and that of many other faunal and floral inhabitants of Earth. In short, what is on the line is the very domain of our discipline and we along with it” (Singer 2009: 815–816). The importance of understanding the ramifications of the Anthropocene (or Capitalocene) to medical anthropology is vast; the health of humans and all living things on earth is affected at a systemic level as a result of our present, highly wasteful and environmentally threatening ‘mode of production.’ We are living on a planet that is currently experiencing the mass extinctions of some species and the overpopulation of others, as well as shortages of the elements that are critical for life—water, air, and food. As we progress through this chapter, we reflect on both our less polluted and more environmentally healthy past, and on the uncertain future possibilities that face us now.

Anthropology has amassed an amazing compendium of tribal and Indigenous people’s wisdom with respect to the environment. Early ethnographies, such as Frank Hamilton Cushing’s work in the nineteenth century, that we discuss below, preserved narratives of people living in harmony with nature, using natural cures, and depending on the movement of animals and the cycles of wild and semi-wild crops for their sustenance. Medical anthropology’s deep commitment to understanding Indigenous people’s ways of healing, traditional approaches to herbal medicines, natural ways of giving birth and environmentally respectful religious beliefs has added to that wealth of knowledge about human–environment interactions. Situating that understanding in the political, social and (more recently) climatic upheavals of the last couple hundred years and processes of industrialization that have polluted the air which we breathe, the food that we eat, and the water that we drink provides us with insights into how quickly environments can change and how thoroughly Indigenous knowledge can be lost. In this chapter, we move from the late nineteenth century, through the twentieth century and into the uncertain future as we explore the intertwined topics of health and environment in the Anthropocene.

A Starting Point

In introducing the case studies, we start with a brief exploration of work done in cultural anthropology during the nineteenth century. Cushing (1981) spent years among the Indigenous groups that he studied, most notably the Zuni in the American Southwest, while working for the Bureau of Ethnology in Washington, DC. His description of Zuni surgery and their use of botanicals in curing provides very early documentation of the power of Indigenous knowledge of healing practices:

The old surgeons took up one after another of the straight lancets, and with them dissected away the proud flesh and other diseased tissue, removing it cleanly without warring vein or artery or tendon, until they had fairly exposed the bone itself. . . . Finally, the openings were filled up or rather stuffed, with the pinion-gum softened by warmth of the breath and in the hands that were the while kept constantly wet with the red fluid. More of this gum was spread on narrow strips of cloth, and with these the wound was neatly closed as with adhesive plaster. The entire foot was sprinkled or thickly dusted over with the yellow pollen and root-power, and then bandaged with long strips of the old rags as neatly as it would have been bandaged by a surgeon among ourselves.

(Cushing 1981: 222–223)

Cushing's descriptions of how the Zuni understood disease and the workings of their bodies, and how they used the elements available to them in their immediate environment to heal themselves when necessary, is a good starting point for our consideration of the role of the environment in human health and wellbeing. In the extract above, Zuni medicine men cure a wounded warrior by excising his rotted leg flesh, irrigating the wound with herbal mixtures, avoiding arteries and tendons as they cut and cleaned. They prescribe a healthy (and meat-free) diet, and cure the man. The ways in which we see the environment as both the source of illnesses and the source of cures has been a thread of investigation that continues to provoke new ways of describing and theorizing in medical anthropology. We emphasize the interpretive process of understanding illness within the multidimensional patchworks of smells, shapes, sounds and tactilities, and the flora, fauna and landscapes that make up our environments (Desjarlais 2003; Feld 1990; Seremetakis 1993).

Places Full of Meanings

Places are full of meanings, none more potent than those places seen as causing harm to human health and happiness. Narratives of places often reveal antagonistic relationships with our environment; we huddle around the campfire to tell tales about ghosts residing in haunted places. Wandering souls, bad spirits who continue to people the world just past the edges of what we can see, cause interference in our lives from the perspective of many people. The Amuzgo Indians of Oaxaca, Mexico, spoke about places where bad things happened to people as being full of emotions that could cause bodily harm and illness to anyone who came in contact with them (Cartwright 2001). The environment of the Oaxacan village was a constant source of morality stories made tangible by the very visible effects of the illnesses that were produced there. An illness narrative that Elizabeth Cartwright's Amuzgan study participants told her came up as they walked by the doorstep where someone had recently been murdered—the fright from that event caused an infected eye in her neighbor Leno; he had walked past the place of the murder late at night, and by the next morning, his eye was red and puffy and his vision was clouded. When she asked what had happened, he told her about the young boy who had been sitting on that particular doorstep, a few months prior, when two men assaulted and murdered him with their machetes. They killed him, Leno said, because he was dealing marijuana. The boy's fright from the attack stayed in that place, making it dangerous, and the fright (*susto*) had caused Leno's eye to swell. The moral evaluations of the actions that led up to the event were instantiated in the place by the narrative; they were made real in another way by Leno's swollen eye. The frights (*sustos*) and angers (*corajes*) that the Amuzgos experienced continued to linger in specific places in the village, causing illnesses long after the original negative events had occurred (Cartwright 2007). What does it mean to move through a village feeling the residual presence of the emotional upsets and pains of past occupants of the area? Like Keith Basso's (1996) descriptions of the ways that Western Apache used their environment as a source of emplaced narratives, the Amuzgos elaborated their environment in a way that made deep connections between their personal health, the social health of the village, and the health of their physical surroundings.

What happens when that environment changes in unpredictable ways—ways that change where food grows, how much food will be produced, and when it will be ready for harvest? Sharon Stephens (1995) described how the Sami reindeer herders of Norway reacted to learning that the lichens, grasses and mushrooms that their herds depended on for food had been irradiated with nuclear fallout from the catastrophic nuclear explosion in Chernobyl, Ukraine, in 1986. Although Norwegian health officials told the Sami not to eat the meat from their reindeer, to be a Sami was to eat reindeer, and so many of them continued to do so. Children and pregnant

women mostly avoided the dangerous meat in the early years after the Chernobyl disaster, but older adults and the elderly were willing to take on the health risks, and continued consuming the reindeer meat. For the Sami, to be part of the environment and part of the natural cycles of consumption was an integral part of life itself.

This attention to the environment emerges in the place-contextualized descriptions of health threats from such things as climate change and pollution. In the following case studies consider the importance of how place is narrated: that is, how meaning created through stories is reflective of a local environmental ethos deeply entwined with understandings of health and illness. Indigenous people of the twenty-first century are the subject of the first case study written by Noor Johnson. Johnson describes how the Inuit people with whom she worked view ‘nature’ in present-day, ever warmer, Canada. We then move to Italy, where Roberta Raffaetà, writing of polluted and toxic environments, and the perceived effects of chemicals on human health, takes us into a discussion of microenvironments and emotions, those ephemeral, often-invisible components of the world that may cause serious allergic reactions. Finally, we move our gaze to the future, to the extremes of inhabitable spaces and places, and in this context, we consider two case studies of one recent disaster—Hurricane Katrina, one by Ben McMahan and one by Vincanne Adams—that illustrate what Singer calls the “pluralea of interactions” that are creating a perfect ecological “storm” of new diseases emerging from a profoundly polluted and out-of-kilter environment (Singer 2009: 797). We first turn to Johnson’s case study.

11.1 Inuit Health in a Changing Arctic

Noor Johnson

Clyde River, or *Kangiqtugaapik*, which in Inuktitut means a ‘nice little inlet,’ is a small hamlet on the northern coast of Baffin Island in Nunavut Territory, Canada. At 70 degrees latitude, four degrees above the Arctic Circle, Clyde River enjoys summer days when the sun never sets and winter days when it never rises. To a first-time visitor accustomed to large towns and cities, this fly-in community appears a very contained place. The hamlet’s physical infrastructure consists of dirt roads lined with prefab housing, a Northern Store that sells groceries, clothing, and equipment for more than twice the cost in Toronto or Montreal, an Anglican church, a community hall, and—since this is Canada, after all—a hockey rink. To the nearly 1,000 primarily Inuit residents who live there, however, the settlement of Clyde River is just a small part of a much larger landscape that includes tundra, fjords, mountains, and sea ice. In this vast terrain beyond the settlement, families create summer campsites where they fish and gather berries, grandfathers take grandsons hunting for their first seal, and relationships between people, animals, and the land are reaffirmed.

Since the 1950s, when the federal government encouraged residents of the eastern Arctic to give up their semi-nomadic lifestyle, Inuit in Clyde River have accommodated and adapted to significant change. Much of this came about through the increasing influence of social policies such as the introduction of a formal, Western education system, health care provision, and wildlife management protocols that regulate hunting of certain marine and terrestrial species such as polar bear, bowhead whales, and narwhal (toothed whale). More recent social and environmental changes stem from increased mining and oil and gas activity, increased shipping, the presence of contaminants in Arctic food webs, and the complex ecosystem impacts of climate change. In various ways, these policies and activities brought Inuit into a system of governance and economic practices that seem alien and often irrelevant to local lives and experiences.

Knowledge of how to subsist in a harsh environment sustained Inuit for millennia. Inuit knowledge is experiential; traditionally, they learned from older family members and by observing and interacting with the Arctic environment and animals. After a generation of children—now adults—was sent away to residential schools in the 1950s and 1960s, this system of knowledge transmission was disrupted. Demographic growth has further complicated traditional knowledge transmission: around

half of Clyde River's population is under the age of 18, making one-on-one instruction in land-based activities difficult. Additionally, equipment needed to travel on the land is expensive; few households have the income to invest in snowmobiles, outboard motors, hunting rifles and ammunition, and camping equipment. Those who do hold a full or even part-time job often find it difficult to balance wage labor with time on the land.

In spite of these changes, however, the land and animals of the Arctic tundra and sea ice continue to play a significant role in Inuit subsistence and sociality. In Clyde River, ringed seal, caribou, Arctic char, narwhal, and polar bear remain important food sources in many households and are a healthier and less expensive alternative to the limited options at the Northern Store. Land-based skills and activities also remain an integral part of Inuit identity, as does sharing and eating "country foods." Hunting, fishing, gathering berries, and spending time on the land are therefore simultaneously material and cultural practices, central to the individual and collective health and wellbeing of Clyde River residents.

Because opportunities to spend time on the land are limited for many residents, community-based institutions play an increasingly important role in connecting people to land-based skills and knowledge. The Iliasaqivik Society of Clyde River, whose name means 'to recognize oneself' in Inuktitut, is a health, wellness, and community development organization that offers a wide range of services for families and individuals of all ages, including programs that implement cultural and therapeutic activities out on the land. Every summer, for example, the organization runs a two-week healing and wellness camp, attended by several hundred people, that offers discussions on topics related to the experience of colonialism, such as residential schools, alongside Inuit knowledge workshops on topics such as how to clean and prepare seal and caribou skins to make clothing. In the winter, the Ataata/Irniq (Father/Son) program pairs experienced hunters with male youth for a two-week trip to fish and hunt seal and caribou. These programs are an important way for many Clyde River residents to continue to spend time on the land in the context of family and community. Although Iliasaqivik's role in facilitating land-based experience is a relatively new development in Clyde River, these experiences offer a sense of continuity in a context of rapid social and environmental change.

Climate Change, Inuit Health, and Social Policy

Over the past half-century, temperatures in the Arctic region have risen at twice the global average. Warming has been accompanied by a dramatic loss of multi-year sea ice and a shift in the period of sea ice cover, with freeze-up occurring later in the fall and break-up earlier in the spring. Inuit depend on sea ice to travel to hunting and fishing areas, and utilize traditional knowledge of ice and snow conditions to determine when it is safe to travel (Gearheard et al. 2013). Increasing instability of ice and changes in its behavior have made travel on the sea ice more dangerous, increasing the risks of hunting in spring and fall, and forcing many to adopt longer, more costly, and sometimes more dangerous land-based travel routes.

Increases in extreme and rapidly changing weather conditions present another climate-related hazard. In Clyde River, elders and hunters have observed that the weather in springtime (March—May) changes much more rapidly now than in the past, increasing the likelihood of getting stuck for long periods of time in hazardous conditions (Weatherhead et al. 2010). Elders report that they can no longer draw on their knowledge to predict the weather, reflecting a wider concern in Inuit society about the viability of traditional knowledge given the rapid pace of social and environmental change. Additionally, climate change is affecting the distribution and abundance of some of the animals that Canadian Inuit hunt, including caribou, polar bear, and fish species and bird species. Complex ecological dynamics related to melting sea ice and thawing permafrost also create synergistic impacts on the level of toxins and heavy metals in the Arctic food chain. Combined with the challenges of travel in an unstable sea ice environment, these impacts raise concerns about food security for Inuit households, many of which already face limited access to country food.

Thawing permafrost has created infrastructural challenges in many Inuit settlements, including slumping roads and cracks in housing foundations. Increased storm severity and coastal erosion due to sea ice retreat, particularly in Alaska, is literally causing some settlements to fall into the sea. While these communities have sought assistance, there is currently little in the way of social policies or legal protections in place to support the high cost of rebuilding and relocating (Shearer 2012). In Canadian Arctic communities, permafrost melt is forcing construction crews to drill deeper when putting in pilings for new homes, taxing the limited resources allocated to address a chronic housing shortage.

These issues directly and significantly affect health and wellbeing of individuals and families in many Inuit settlements.

Inuit health in a changing climate is shaped significantly by social policies and regulations such as hunting quotas that limit adaptation options. In the past, for example, Inuit responded to changes in the Arctic climate by shifting their hunting to focus on different species; under a quota system, these kinds of adaptations are likely to be restricted (Wenzel 2009). Inuit are concerned, as well, about the potential for national and global biodiversity and climate change policies to create new restrictions on hunting. Some conservation and animal rights organizations have lobbied to have the polar bear listed as ‘threatened with extinction’ through the Convention on International Trade in Endangered Species (CITES), a global treaty that regulates trade of certain animal species. Inuit Tapiriit Kanatami, a national Inuit organization in Canada, argues that this designation would not have any clear benefit for polar bear conservation, but would harm Inuit livelihoods and infringe on their hunting rights.

From Knowledge to Action

In the Canadian Arctic, reclaiming local ownership of knowledge production has been an important part of decolonization. In 2005, Clyde River residents founded the Ittaq Heritage and Research Centre, an organization that supports community ownership of and involvement in research projects in the community. Through Ittaq, community members have collaborated with researchers from the National Snow and Ice Data Center in Boulder, Colorado, to install local sea ice monitoring stations and portable weather stations to better understand the changes that are occurring, drawing on traditional knowledge to site these instruments and analyze the data they collect (Gearheard et al. 2013; Weatherhead et al. 2010). Community residents use the information generated by the stations to make informed decisions about travel on the sea ice.

At a global level, Inuit knowledge of climate change contributed to the Arctic Climate Impact Assessment, which included a chapter on Indigenous knowledge (Huntington et al. 2005). Inuit knowledge, including interviews with Clyde River elders and hunters, played a central role in a landmark human rights petition, submitted in 2005 to the Inter-American Commission for Human Rights. The petition was led by the Inuit Circumpolar Council (ICC), an Indigenous peoples’ organization that represents the 155,000 Inuit from Alaska, Canada, Greenland, and Chukotka, Russia, in global political arenas such as the United Nations and the Arctic Council. The petition made a case that the human rights of Inuit, including rights to subsistence and to bodily health and wellness, were being violated by the United States in its refusal to regulate its greenhouse gas emissions. Although the Commission rejected the petition, the widespread media coverage it gained helped build a case that climate change infringes on human rights.

Although documentation of Inuit knowledge and community-led monitoring initiatives have been important, when I was in Clyde River in 2009–2010, I encountered a sense of impatience with research and an interest in moving towards tangible, concrete action. “Is there anything that can be done about climate change?” one man, an active hunter in his 50s, asked me. A woman in her early 30s told me that elders were tired of talking about climate change because they had already shared their knowledge extensively and had seen little in the way of policy action or response. Global and scientific climate change discourses are also at odds with some of the ways that residents understand and relate to change. For example, Inuit observe natural cycles such as fluctuations in wildlife populations over time. Some residents explained to me that recent changes in the environment may be part of a cyclical process. Other community members made connections between environmental indicators, such as more flowering plants and shifts in the number and range of animals and fish, and evangelical religious discourses of repentance and healing (Johnson 2012). A Western scientific perspective, in contrast, correlates similar indicators with climate change.

Rather than research on climate change, then, Clyde River community members were interested in initiatives that would build and strengthen social ties, assist with traditional knowledge transmission and teaching land-based skills to youth, and support other health and wellness needs such as suicide prevention, access to healthy foods, drug and alcohol abuse prevention and treatment, and counseling and mental health services.

To give one example: in the fall of 2010, I accompanied a group of Inuit women from Clyde River and the nearby community of Pangnirtung on a four-day berry-picking trip. The trip was funded by a Canadian federal agency, Health Canada, through a program focusing on climate change and health adaptation. The stated purpose of the trip, described in the proposal that Ilisavivik submitted

to Health Canada, was to document Inuit women's observations of climate change, since much of the research on Inuit and climate change has focused on men's hunting activities (Dowsley et al. 2010). For the participants, however, the trip was about building social ties by spending time together on the tundra and bringing home as many berries as possible to share this delicious and culturally important food with their families.

The women spent long days patiently filling buckets with crowberries and wild blueberries. While they picked, they shared stories and talked about challenges and hardships they had faced and overcome, associated both with past life on the land and with living in permanent settlements in the present. Climate change was never discussed overtly, but these activities were a way for the women to process change together and to strengthen their networks, reflecting a grassroots, holistic perspective that understands that social and environmental changes are inextricably connected.

Conclusion

Inuit in the Canadian Arctic, along with other Arctic Indigenous peoples, have been among the first to observe and experience significant changes in Arctic ecosystems brought about by global climate change. Changes such as melting sea ice and permafrost and unpredictable and extreme weather have direct impacts on Inuit health and wellbeing. Far from experiencing these changes as uniquely environmental, however, Inuit view them in the context of a longer history of social change associated with life in settlements under governance systems that often fail to consider or understand local priorities and perspectives.

Inuit understand that to respond proactively to change requires working to heal and address past and present traumas and challenges, such as those incurred by social policies like the residential schools program or the presence of alcohol and drug abuse in their communities. It also requires maintaining strong social connections and working to ensure that land skills are passed on to younger generations, while being flexible and adaptive in the face of changing social and environmental conditions. Institutions like the Iisaqsvik society play an important role in supporting these various wellness activities and initiatives. Flexible social and health policies that strengthen Indigenous and local institutions will help ensure that bureaucratic governance systems support rather than interfere with the ability of community members to prioritize and act on their own understandings and visions of change.

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In the context of a changing Arctic climate, the Inuit are finding new ways to build their social community through re-learning traditional forms of hunting and food gathering. Healing the ills of alienation from the land, compounded by a sedentary lifestyle and unhealthy food choices at

the local stores, is achieved through engaging in hunting, fishing, and berry picking—all activities that provide natural foods and opportunities for elders to narrate Inuit ways of living to younger members of their community, in ways that engender pride and wellbeing in the participants. The old ways of sensing and making sense of the environment in the Arctic are changing with global warming, thus introducing uncertainty into the lives of the Inuit. The environment of the Arctic is a bellwether for how our world's climate is changing, shifting, and becoming more fierce and unpredictable, as we will see later in this chapter.

The Hostile Environment

Government agencies, anthropologists and other scholars, and lay publics have all played a role in monitoring the environment, introducing and enforcing legislation to reduce risk, and attempting the clean-up of areas which are known to be dangerously polluted. There has been growing attention, in these different domains, to the short- and much longer-term effects of environmental toxicity, and, at times, evidence of the suppression of evidence that might hold particularly companies or governments culpable. Anthropological and other social research on the Chernobyl nuclear accident mentioned above (Petryna 2003), the gas leaks in Bhopal in 1984 (Fortun 2001), and on the leaks at Fukushima nuclear plant following the Tohoku earthquake and tsunami in 2011 (Furukawa and Denison 2015) all illustrate how power is played out in the most shocking environmental disasters.

But human health is not only negatively affected by such dramatic examples of pollution. Air, ground and water pollution, food contamination, toxins used in manufacturing such as, historically, asbestos and lead, and radiation, all create risks to human and other animal health. Industrialization and development, and in this context, the use of toxic chemicals in industrial practices—in mining, agriculture, and manufacturing—all impact people's health. Health is affected, for instance, by outdoor air quality from vehicles, smokestack emissions, fossil fuel used for heating, and from direct exposure to and drift from farm chemical sprays. Additives to food to extend shelf life, a necessity where food is shipped across continents, can also compromise health unless tightly regulated. Indoor air quality, including in relation to the preparation of food, and noise and air pollution in working environments, all too have negative impact on human health, leading to public sensitivity of the environment as pathogenic. We constantly move through dangers of all kinds: from micro-dangers like allergens and toxic chemicals to macro-dangers like fast-moving vehicles, hurricanes, tsunamis, forest fires and earthquakes.

In the following case study, Roberta Raffaetà describes a region in Italy that has been severely polluted from manufacturing industry and commercial agriculture. It is also an environment that is increasingly urbanized. The chemicals in the environment, both outside and indoors, are perceived by local residents to play a role in causing their allergies. Allergy sufferers struggle in vain to get away from the chemicals by physically removing themselves from the polluted environment; their desperation is palpable. Italian medical doctors also pay significant attention to toxic interpersonal conflicts that may cause allergies, and they routinely prescribe psychological consultations and psychiatric medications for allergy sufferers. The environment writ large and small is layered in, around, and through us. When that environment is toxic, the sensitivities and reactions that result can be devastating. In her case study, Raffaetà takes us deep inside the disease, to investigate the microclimate of people's homes and psyches. The way that we react to what is going on around us in the most intimate of spaces is of primary concern for her participants suffering from allergies.

11.2 Environmental Pollution and Allergies

Roberta Raffaetà

Allergic symptoms are increasing globally. Epidemiologists estimate that by 2015, 50 percent of the global population will suffer from some kind of allergic reaction. Despite its widespread occurrence, there is still much debate about the causes of allergies (Raffaetà 2011a). In my own field research, conducted between 2004 and 2008 in Verona (a medium-sized city in northeast Italy), environmental pollution was identified as the main cause by people suffering from an allergy (Raffaetà 2012; 2013). Allergologists, on the other hand, usually refused to recognize environmental pollution as an important cause of allergies and explained allergic patients' 'obsession' with environmental pollution simply as a sign of psychological problems (Raffaetà 2011b), and after consulting an allergologist, people with symptoms of allergy often ended up with a referral to a psychologist.

In biomedicine, the 'hygiene hypothesis' suggests that allergies are provoked by living in a world where bacteria and parasites are significantly reduced by public health interventions such as the wide use of antibiotics and mass-scale vaccinations. Lifestyle changes such as improved hygienic conditions, few siblings, and much time spent indoors are also implicated. All these factors have reduced the opportunity for individuals to get infections and so be exposed to a wide variety of organic substances. According to the hygiene hypothesis, the lack of bacterial and parasitic infection and the scarcity of biodiversity put our immune systems into a state of inactivity. The immune system, in this context, triggers randomly against otherwise harmless substances such as pollens, latex or nuts, provoking allergic symptoms. This hypothesis is consistent with very recent attempts to think about health and illness in terms of a microbial balance. The human microbiome is defined as the ecological community of various microorganisms contained in the human body and on its surface. Recent studies highlight the crucial role of the human microbiome in the regulation of many vital functions, including those related to immune reactions.

The hygiene hypothesis deals with the alteration of the human microbiome caused by a modern lifestyle that has lost contact with parasites and bacteria, the so-called Old Friends in the biomedical literature. Unfortunately, it neglects what I term the 'New Enemies,' new entities represented by the wide array of chemicals and toxins. These, too, have an impact on the human microbiome.

The city of Verona, and its surroundings, are located in an area that experienced massive industrial development after the Second World War. While agriculture continues to play an important role, small farms have been sold to larger agricultural companies and agriculture has increasingly become industrialized and intensive, changing the organic composition of soil and air, the appearance of the landscape, and the ways in which people live. Laborers, traders, service workers and white-collar workers have replaced peasant farmers, and animal breeders. A strange smell—a mixture of dung, cattle feed, fertilizer and fumes—pervades the plains surrounding the city. The rivers, once part of the social and economic life of this region, have become polluted and are no longer used by local residents. People are now in frequent contact with various substances and technologies that have altered practices, habits and relationships to the human and non-human world; new chemical particles and toxins have appeared. New molecules have been introduced through technological processing (such as the introduction of GMO); the effects on human health of which are still under debate. Moreover, technological substances introduced in people's daily lives are usually standardized in their composition, so aggravating the problem of biodiversity depletion. These changes surely matter for people suffering from an allergy.

Environmental pollution strongly influences people's daily strategies to prevent, treat and live with their allergies. Below, I demonstrate that environmental pollution matters for people suffering from allergies. Allergic symptoms prompt us to think outside psycho-sociocultural or physiological categories. Allergic bodies bring to light a different order of reality, one that ignores comforting dichotomies and that can be defined as the order of a *body-in-relation-to*.

Bianca

9 AM, 3 November 2004; the waiting room of the allergology department of a public hospital. Outside it was very foggy, lightly raining and still quite dark, a typical autumn early morning in Verona. About 15 people were waiting for their appointments. Some had already been tested

but had to wait a couple of hours more for further testing. Apart from reading some old magazines, people in the room were quite bored. While waiting, they were glad to chat with me. I approached Bianca, a 68-year-old widow who described herself as “an housewife who feels well when she stays at home. I am not one of those women who like to go around. . . .” However, she continued, recently her beloved house had transformed into her worst nightmare. During the summer, the wall behind the kitchen tiles had been painted. The day of the painting, she had cleaned the doors of the kitchen with bleach, but they were particularly dirty so she also used a strong cleaning powder. While she was busy cleaning the doors, her nose began to itch. A few minutes later, her eyes and her tongue began burning. Initially she thought that the cleaning powder might have caused the reaction. She went to the emergency room but, after some tests, the doctors told her that the reaction was not caused by the cleaning powder and that her symptoms would disappear in few hours. The next day, patches of eczema appeared on her back. While these responded to a topical cream, the burning in her nose, tongue and eyes continued to worsen: “The burning is so intense, it is so disturbing. When I go to bed I cannot pull up the sheets, I have to keep them below my waist because the burning is so painful.” She also began to notice a strange smell on herself and in the house:

I do not know what this smell is. I smell it on me, but nobody else can smell it. When I am at home [she sadly laughs], I continue to smell the walls, the furniture. I open the fridge, and from there also comes that smell. But I do not know what that smell is! I think it comes from the walls because I smell it when it is humid, I sense it is in the wall, in the tiling on the floor and in the furniture. I can smell it on me, too. I ask my daughter and other people to smell me [pause] also when I pick up the phone and I raise the receiver to my ear to speak I perceive the smell. What is it? Does it come from my mouth, from my body?

Bianca looked desperate. She said she could not stay inside her house anymore. When she gets up in the morning, she tries to go out as soon as possible to go to shopping:

Even if I do not buy anything, it is an excuse to go out. I try to keep myself busy and to stay out until midday. At midday I come back home. If it is sunny I open the door. Some days, however, if I open the door I feel the smell even more intensely. Maybe this is because of the humidity, which comes from outside, and gets on the walls, contributing to the smell.

She cooks her lunch and waits until three o'clock, when her daughter—who works in a bar—comes back home. Soon after her daughter's arrival, she leaves again and goes to the public gardens. But when I meet Bianca, it was getting cooler in Verona and the days were getting shorter. Bianca was anxious because for the last week she had not gone to the gardens. “What's the point of getting cold? It is so wet, there is a lot of humidity. As soon as it is sunny it is ok, but after that. . . . I cannot continue such a life. I do not know what to think anymore; I do not know where to spend my days.” Her nights were also difficult. With the winter approaching, in the evening she had to switch on the heating for a couple of hours, but then she switched it off during the night, otherwise her nose, tongue and eyes would begin to burn.

Bianca was convinced that chemicals in the paint caused her condition. One of her friends told her that other people had the same reaction after having painted the walls of their homes. But none of the medical doctors could find anything wrong with her and she was left without care: “I do not know anymore what to think, where to go. . . . I even went to the Ministry of Health. They told me that chemical allergies are difficult to trace and that I have to be patient. I've been waiting, but I am still here, feeling stupid, and the winter is approaching.” She also went to the company that had painted the kitchen to express her concerns. “They told me that it might be true, they did not say that the paint is harmless! They said that I might be sensitive to some ingredient. They said that I am the first person to have these symptoms. And then they gave me the list of the components of the paint, but I don't think that the list was complete.” The high number of chemical compounds, their ubiquitous nature in her house, and the various interests involved all complicated Bianca's quest for care. The uncertainty of the diagnosis, the need to reshape her routine and the poor recognition of her bodily symptoms were making Bianca's life very difficult: “I was never sick, it is the first time I have ever had a serious ailment. I might be laughing now while we're talking [pause] but if you could see what is inside me [pause], this condition is going to give me a nervous breakdown.”

Bianca's daughter and neighbors accused her of suffering from a psychosomatic disorder. Bianca refuted this, affirming that what she felt was "true and real." How 'real' was environmental pollution in Bianca's life? She had visible bodily reactions—the eczema and the constant burning sensation in her nose, eyes and tongue, and she had made very tangible modifications to her daily routines as a result to avoid contact with what she believed was producing the negative effects in her body. These embodied alterations stand as 'real' against the politics of multiple regimes of scientific and biomedical 'truth.'

Erika

It was 4 PM, and I was in a bar in the city center to meet Erika. I easily recognized her from her description, and we introduced ourselves; we ordered something to drink and started to talk. Erika told me how she had suffered from allergies since childhood. As an infant, she had severe dermatitis that covered her entire body, and was treated with large doses of cortisone. This provided temporary relief. Subsequently, she was diagnosed as suffering from mite allergy and an allergy specialist prescribed a cycle of immunotherapy. This, too, had limited effect. Finding no cure, after some years she turned to a homeopath who prescribed pills to detoxify her. The detoxification process forced her to bed for three days, with weeping sores and high fever. According to her homeopath, this reaction was caused by the elimination of toxins that had accumulated over the years from exposure to chemicals in her food and the environmental. Since then, she reported feeling much better, although her allergies had returned. At this point, with the help of a psychotherapist, she became aware of the fact that she 'polluted' her body by an excessive attachment to her mother; Erika's father died when she was 10 years old. After modifying the relationship with her mother, Erika said that her symptoms had diminished. She then encountered a naturopath who suggested that she join a breathing meditation group: "Initially my symptoms became very bad. I developed eczema everywhere, my breasts and genital areas included. After the initial rash, though, I healed. It was as if I had spat everything out, I was clean. There were no more toxins, there was nothing. Now I can even scratch my skin when I am stressed; my skin is resilient." Erika told me that she was starting to enjoy her allergy-free life. Even so, she confessed, one allergy—to cats—persisted. She told me that if one can understand the real cause of an allergy you should be able to eradicate it. A friend of hers had successfully resolved her son's allergy to dogs, which had a psychological basis. Erika tried to identify how cats could be linked to her personal history but could find no connections.

As we continued to chat while walking to our cars, Erika reflected on life's unpredictability and told me how her sister died when Erika was 14. "I think that certain things have to happen, that's all. In the case of my sister's death, for example, there was no logic. It was really unbelievable, if you think. She was driving her scooter and a cat was in the middle of the street. Probably she tried to avoid it . . . she crashed and died from her injuries. She wasn't going fast at all. Imagine, dying for a cat!" At these words I felt the blood freeze in my veins. I felt trapped in a game that I did not want to play; quite naively, I assumed that one of the rules of a good researcher was to try to not interfere too much with the research participants' lives. But the connection was too apparent. I looked at Erika and I could not stop myself from saying: "Erika, do you still ask yourself why are you allergic to cats?!" She shuddered, looked at me in wonder and brought her hand to the mouth. Bewildered, she stared at me and whispered, "How could I not think of that . . ." About two months later I received a phone message: "Thanks Roberta. I am not allergic anymore to cats! Hugs Erika."

Following the traditional model of the division of psyche and soma, Erika's narrative about the causes of her allergies could be divided in two main types of explanations: one is material and the other is psychological. In the first case, she refers to 'toxins,' 'pollution' and 'chemicals' with reference to the physical world; in the second case she speaks of 'toxins' produced from an unhealthy family relationship or unresolved traumas, toxins produced in the socio-affective environment that were the products of a relationship between her and other people. The two analytical categories are, however, not so clear-cut. For example, when Erika recounts the breathing technique to remove toxins, it is not clear if she considered the toxins as from the physical environment or from the complicated affective relationships with her mother. The two are so interlinked that for Erika, there was no need to distinguish them: she spoke both of "spitting out toxins" and to "stress." The two were blended in her account. This was not just a matter of language; Erika's skin spoke even louder than her words, in her mind, inseparable from her father's death, her mother's suffocating attachment, and the cat that caused her sister's death.

Her life history and the emotions attached to it were literally toxic, embodied in her flesh, receptors, bone marrow and the millions of fibers attached to it.

The Sustainability of Bodies-in-Relation

By taking seriously the embodied experience of people with allergic reactions, who describe their illness as linked to environmental conditions, it is possible to depict the environment as a complex set of relations between various elements. The ‘reality’ of the impact of pollution on people’s bodies emerges in the complex assemblages of sensory perceptions, discourses and practices. Suffering from allergic symptoms is to enact—both through the flesh and the self—a breakdown in the relationship with what is outside one’s body and one’s self.

Allergy helps us think about the human condition as an unfolding field of relations between the human and non-human world. These relations are not separated, but constitutive of what is going on throughout the organic world. Between emotions, organic tissues of bodies and toxins, there is a system of “mutual constitution from which no particular element emerges as the origin, pre-determining term” (Wilson 2004: 19). The relation between the elements, rather than the elements themselves, determines the final configuration. An allergy is not just a metaphor or a representation of an emotional reaction to external relationships; it is one of the various shapes taken at the level of the skin, the nose, the eyes, the tongue and the body (Raffaetà 2012). Sensitivity in touching, eating or smelling certain substances does not *represent* some emotional state; it is a direct enactment of toxic relationships.

Tim Ingold (2011: 70, 71) argues that “(t)hings *are* their relations . . . ‘the environment’ might, then, be better envisaged as a domain of entanglement.” A crucial question, however, is rarely addressed: which relations are sustainable for us? What is the threshold of sustainability for human beings? Anthropology does not simply argue that all people are in relation with others—leaving things politically ambiguous; anthropology’s role is to investigate the place of human beings within these relational webs. As Latour (2004: 5) has asserted, “political ecology has nothing to do with nature,” in the sense that what is usually understood as ‘nature’ will survive no matter what transformations take place. The real problem is the survival of human beings in shifting landscapes. It is up to us to decide if we want a sustainable future or if we want to become allergic to whatever surrounds us.

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In contrast to viewing the home as a dangerous place, MacPhee’s work (2012) on household health practices in Southern Morocco focuses on how women’s daily routines are replete with small protective acts within the environment of the home that range from dietary choices to prayers for the protection of health and wellbeing. Humans hedge against dangerous environmental encounters through a myriad of acts of protection; they are constantly alert to the sensory signals around them. The anthropology of the senses adds to our understanding of the

environment by including the ways that sounds, tastes, and smells are made culturally meaningful over time and through processes of embodied discourses. Seremetakis (1993) talks about this process of meaning-making as *commensality* that she defines as “the exchange of sensory memories and emotions, and of substances and objects incarnating remembrance and feeling.” Incarnate (from the Latin *incarnare*, ‘made flesh’), past frights, pollutants, and contact with bad things are written into persistent eczemas, swollen eyes and inflamed spaces of the lungs. These are meaningful commentaries on how humans suffer within their lived and perceived environments.

The Bigger Picture

Increasingly, scholars are grappling with how human health is affected by variations in the environment, most recently due to economic development, climate change, and human and animal mobility and habitat. A growing number of studies of health and the environment are now falling under the appellations of ‘One Health,’ ‘Ecohealth’ and ‘Microbiome’ studies (Wolf 2015). This work has built on and extended the biomedical and social research conducted from the 1970s on ‘tropical diseases,’ of which those that are vector-borne highlight the relationships between humans and their natural and built environments (Manderson et al. 2009). Deep understandings of the connectivity of humans and other living things is emerging from research on parasitic infections, pandemics, re-emerging and newly emerging diseases (Lowe 2010). Inter-species infections and environments modified through the twisted and polluted pathways that characterize so many parts of the globe are resulting in new disease panoramas that are best understood via multi-disciplinary teams that include social, biological and medical scientists. Anthropologically, we are challenged with the idea that there are patterns of culturally understood health risks present across these newly conceptualized environments.

Olson (2010), in her work on the ecobiopolitics of outer space travel, provides a window into thinking on this enlarged environmental scale. The NASA workers who Olson describes conceptualize themselves with respect to the harsh environments of outer space as they encounter it through the technologies of survival at their disposal. The spacesuits, spacecraft and all the attending space technologies are the outer milieus that enable human biological life to be extended into territories where it formerly would not have been possible. Along with that extension of life into new terrains comes a different form of normal that Olson calls “space normal” (2010: 172). The physiological stresses that the astronauts endure are captured via the data-gathering systems of the space shuttle and, importantly, they are understood and analyzed in conjunction with the functioning of the shuttle itself. The health of the astronauts is thus intertwined with the health of their transportation vehicle. Risk is calculated across time via the progressive changes in the functioning of both the humans and the machines that transport them into space. We return to the notion of risk below.

In the following case study, Ben McMahan takes us to coastal areas of the United States affected by hurricanes, oil and gas exploration, urbanization and pollution. The slow-moving changes of the environment are constantly in the process of creating new environmental dangers. The Gulf Coast that McMahan describes is an environment that is slowly shifting, vulnerable to the rapid onslaughts of regular and extreme atmospheric events like hurricanes and flooding. The technologies of environmental control used along the Gulf Coast, the levees, the building codes, the atmospheric tools of prediction, are used, under normal conditions, around the clock; their functioning becomes especially critical during emergencies when they are essential for human survival.

11.3 Reading the Environment

Ben McMahan

Every storm is important, but some storms they just have water over your baseboards—and I'm not trying to minimize that—but I'd take that over this flood we just had . . . but I have not talked to anyone that's ever seen anything of this magnitude. I'm talking back 80 years . . . I've seen many many talks, especially from meteorologists . . . they had models and they had slides . . . of where category 1 storms would be, category 2, category 3, category 4, and category 5, and where it would flood. . . . What I understand is that since this hurricane they have now quit judging water levels . . . they just can't do it—because no matter what category storm it is, it only matters what the surge can be . . . and this [Ike in 2008] proved it . . . they can't really predict what kind of surge it's going to be.

(Political official, Southeast Texas)

The US Gulf Coast stretches for approximately 1,630 miles, from its southernmost point on the US/Mexico border in Texas, to the southern tip of Florida. There is a wide range of social and environmental systems along this arcing coastal landscape, including highly developed vacation and tourist resort communities, sprawling urban/suburban metropolitan zones, and undeveloped 'natural' spaces, many of which are within state and federally protected wildlife areas. There is also considerable sociocultural diversity, tied to complex and overlapping histories of numerous ethnic and social groups. People with African American and Afro-Caribbean, Cajun, Chinese, European, French, Indian, Mexican, Native American, and Vietnamese heritage have settled along this coastline, as waves of new arrivals have joined established groups.

The region has a long history of resource extraction industries—of timber, agriculture, seafood, and most recently, oil and gas. In Louisiana and parts of Texas, these industries expanded to drive economic growth and demographic change: the increased demand for a stable workforce in emergent and developing industries stimulated population growth and community development,¹ with a pronounced effect on the local physical environment. In Southeastern Texas and Southern Louisiana especially, oil-and-gas-related activities have become the economic mainstay of the region, with both good and bad impact socially, economically, and environmentally.

Hurricanes are prominent in both social and meteorological histories. Hurricane season comes every year from June to November, when the entire coast is subject to the possibility of a direct hit or a regional disaster. The experience of hurricanes is an important part of life on the Gulf Coast, and can act as a galvanizing force through the collective trauma of a disaster or crisis, or the anticipation of a storm season, even if no serious storms actually affect the community. These impacts are also tied to the local history and context of the community, and the experience of hurricanes is contingent on interactions within these nested social, economic, environmental, and historical contexts. In the unlucky event of a severe storm layering onto pre-existing social inequality, environmental degradation, or failures of government, the consequences can be catastrophic.

Hurricanes are best understood as complex assemblages of variable experiences, shaped by historical and environmental context, political and economic motivations, senses of place and regional identity, all of which play out in an increasingly chaotic sociotechnical system that lies at the intersection of social-environmental systems and natural meteorological hazards. Like many other 'natural' disasters (cf. unnatural disasters, Jackson 2005), the potential threat and the strategies to mitigate risks are tied to patterns of human intervention into 'natural' systems, in an effort to harness or deflect the power of the natural world. These interventions place ever increasing populations under threat of natural, social, environmental, or technologically mediated risks, especially when the protection systems fail, or other modifications alter the landscape in ways that further amplify risk (cf. Bürgi et al. 2004).

The threat of Gulf Coast hurricanes and their aftermath came into sharp relief during the 2005 hurricane season, when Katrina and Rita hit the Gulf Coast in quick succession. This pair of storms highlighted general gaps in preparedness capacity, and the levee protection system, as well as specific problems associated with ongoing social inequality and environmental degradation in the region. Hurricanes may be a persistent reality for the Gulf Coast, but not every season leads to an imminent threat. The possibility of crisis requires communities and government institutions to remain vigilant and prepared, lest they be caught off guard at a time of disaster. Hurricane Katrina demonstrated the

consequences associated with the intersection of social conditions, political realities, and an environment of risk, and is a stark reminder of the consequences of the intersection of a 'natural disaster' with widespread and persistent social inequality and governmental inefficiency.

Widespread environmental modifications associated with the oil and gas industry (channelization, canal building, dredging, wetland degradation, etc.) made an indelible mark on the landscape over decades of intensive modification and development. Other interventions are visible in municipal and residential contexts, such as infrastructure projects using levees and seawalls or elevated homes, designed to protect households and communities from the threats associated with seasonal hurricanes and coastal flooding. This is a complicated dynamic, as oil industry activity degraded the local environment and amplified the potential damage of hurricanes and coastal flooding, while simultaneously enriching many of the residents living in these same communities. At a larger scale, the oil and gas industry has driven economic growth at community or regional scales, but Gulf Coast communities have suffered the consequences of this growth through coastal land loss, wetland fragmentation, pollution, and environmental degradation.

This highlights the complex way that local and regional risk-scapes are produced, and the clustering and accumulation of diverse risks, including economic volatility, social disruptions, hurricane threats, and coastal flooding, are important parts of the story of hurricanes and disaster in this region. To understand the everyday life of risk on the Gulf Coast is to see the system as a twisted network of interactions, of layered effects, and accumulating experiences. 'Social' systems and institutions are embedded within a 'natural' landscape, but this distinction is problematic, especially in a region where economy, environment, and social structures are so entangled.

The convergence of prediction technology, population management techniques, disaster preparedness and response planning forms the basis of the modern emergency preparedness project. Modern emergency preparedness strategies and logic are focused on the future in the present—the way in which descriptive statistics and predictive modeling can help officials better understand the potential of a possible storm, and therefore enact plans to better protect a population from harmful outcomes. Predictive technologies, meteorological models, and historical storm track data act as an organizing force for an otherwise unwieldy scientific phenomenon (hurricanes), and allow for order to be made of the chaos of storm seasons.

Storm models and predictions are designed as 'objective' measures of observable phenomena that lead to better understanding of storm patterns and better predictions of the possible tracks, storm potential, and outcomes of hurricanes. The manner of how models and data are used, the power embedded within their deployment, and the compulsory power and governance over populations they can engender through their production are also key components of a more careful look at these data and models. As predictive technologies become more accurate, increasingly complex, and better developed, it is important to understand how they are operationalized and deployed, and to understand the productive power or compulsory control they purport to hold over populations.

Modern emergency management strategies emphasize scientific predictions and bureaucratic recommendations (to evacuate: when and where), instead of relying on accumulated knowledge and experience. Discourses about preparedness quickly morph into discourses of personal responsibility in terms of following government recommendations, with the associated judgments of character and intelligence when these recommendations are not followed. Residents of coastal communities can choose to embrace this transition, but this discussion goes beyond simply passing judgment on those who do not respond to emergency management dictums, or otherwise ignore 'rational' decision-making processes in the face of a looming disaster. Expertise is no longer the sole province of credentialed experts, as citizens can empower themselves through this process of consuming (existing) and producing (novel) scientific data and models, as well as conveying this knowledge and expertise to friends or family.

Seasonal Hurricanes and Layered Effects

National media, federal emergency management, and the general public typically treat individual hurricanes as unique and isolated events. But hurricanes are cumulative crises owing to the layered effects of spatial and temporal overlap between acute events and long-term changes to the environment, social disruptions, and institutional breakdowns. Emphasis on the acute over the chronic captures the particulars of a given storm, but this ignores the long-term effects that are embedded within the social and physical landscapes, and the cumulative effects linked to multiple and overlapping events.

Technological intervention in a built environment helps mitigate the acute threats that hurricanes pose, although these interventions do less to address long-term chronic changes to the landscape. These interventions serve a similar role to the maintenance strategies required for dealing with chronic health problems in individuals, and the parallels to chronic health are an instructive and intuitive link (cf. Thorne 1993). Parallels between managing for chronic landscape change and chronic health problems include the maintenance strategies required to deal with chronic effects, the threat that acute episodes pose to general (environmental) health, and the destabilizing effect that an acute event can have when layered onto a chronic problem. Whether as a metaphor or as a guide in designing policy, visualizing the landscape in terms of chronic environmental health helps focus on the holistic issues that shape clusters of experience, rather than acute interventions that target specific issues.

The chronic and (relatively) slow-moving nature of coastal environmental change also highlights one of the fundamental concerns about these systemic shifts within an environment of layered and overlapping risks. Solutions are typically oriented towards immediate tangible solutions to acute and fast-moving problems. The water is rising and we need you to elevate your home. The channelized river is at an ever-greater risk of flooding, and we need to build a seawall and bulkhead the river to mitigate this risk. There is a storm threatening the region, and we need you to evacuate. In isolation, each of these events has a solution that is unique to the context in which it is experienced. But by looking at the context of the US Gulf Coast and the environment of risk of hurricanes, from the perspective of the layered effects of hurricanes, it becomes clear that solutions to these layered crises will require similarly complex responses. If the wetlands are crumbling and storm surge flooding poses an ever-greater risk, simply elevating homes or evacuating for each storm is a set of stopgap measures. If the flooding continues to worsen over time, you will have to elevate your home even more or evacuate even more often. Building more and more homes and businesses in a hurricane-risk zone increases recovery and insurance costs, and at some point, people within and outside the region will question whether it is sustainable or cost-effective to repeatedly rebuild in an area under persistent threat.

A number of barriers exist to developing holistic responses to these challenges. One barrier is the sociopolitical context of environmental change on the US Gulf Coast in oil and gas country. Some environmental changes are directly attributable to the impacts that decades of oil and gas extraction activities have had on the landscape, such as extraction and subsidence, channel building, and so on, while others are attributable to ancillary activities associated with oil and gas activity (navigational traffic, climate change, etc.). Many people made their careers in the oil and gas industry, and the region leans right in terms of political orientation; both these facts hinder the embrace of an 'environmentalist' perspective. There is also a sense that technology will lead to advancements to further mitigate environmental risks (elevated homes and highways, new building technologies, advanced levee construction), and that it is only a matter of time before some advancement in technology renders all the "hand wringing about climate and hurricanes and the coast moot," as one research participant observed. This increases the dependence on technological intervention. There will come a point when these interventions are either not sustainable in terms of pragmatic concerns over cost-effectiveness, or quality-of-life issues over what degree of risk is tenable and acceptable, or both.

A second barrier to developing a holistic approach to landscape alteration and degradation is the way in which disasters are managed at the level of state and federal government. Disaster declarations are a complex process with political and economic implications that dictate when and how they are made. But a key feature is that they refer to an isolated event or disaster, and not to the chronic long-term conditions of Gulf Coast living. They can only be made for an acute event, not for the accumulative impacts of decades of gradual change. The cumulative effects of landscape changes, environmental degradation, social disruptions, and skyrocketing insurance costs may all come together to form the 'real' disaster facing Gulf Coast residents. This is a slow-moving series of linked events, not a discrete disaster easy to declare. For an acute event, you can pose for pictures as you write the checks, and move on to the next crisis. For a long-term chronic crisis, it is much more difficult to strategically position or frame a response. Recovery funding is similarly dependent upon acute storm events: a number of NGOs that expanded their operations in Texas and Louisiana, post-Katrina and Rita, were forced to scale back their operations as the funding dried up.

There are drawbacks to focusing on the layered effects when problems are complicated; they are rarely easily or elegantly solved. One reason that the operations of FEMA (Federal Emergency

Management Agency) are focused on acute events is the relative simplicity in management that goes along with writing a check for losses sustained in a specific disaster, rather than a complex analysis of the social and environmental factors amplifying the risk of hurricanes on the Gulf Coast. This ruthless pragmatism of government agencies has left a void, and two primary forces are working to address these complex problems, albeit from radically different perspectives. First, existing and novel non-governmental organizations are taking up some slack in addressing the effects of environmental risk along the coast. Second, the insurance system governing the Gulf Coast operates on a continuum between collective and actuarially monetized risk. On one end, case management and careful consideration of the experience of individuals and households helps NGOs better address local problems, while on the other, actuarial tables and rational choice models are deployed to determine what is cost-effective, and therefore permitted.

“The industries were there because of the river,” John McPhee (1987) famously wrote in his essay in *The New Yorker*. “They had come for its navigational convenience and its fresh water. They would not, and could not, linger beside a tidal creek. For nature to take its course was simply unthinkable. The Sixth World War would do less damage to southern Louisiana. Nature, in this place, had become an enemy of the state.”

Note

1. There is a long history of this economic expansion, beginning with agriculture (especially sugarcane) and timber (cypress extraction), continuing into hunting, trapping and seafood, and culminating in the current state of oilfield work. See Austin and Woodson (2012) and McMahan (2014) for details.

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The ways in which cultures construct notions of risk are linked to their perceptions of dangers, the technologies that they use to detect and make visible what is dangerous, and the sociopolitical systems that set up the rules about how to respond to what is defined as a ‘risk’ (Cartwright 2013; Douglas and Wildavsky 1983). Risk becomes a concept that is multi-level, culturally specific and contextually enacted in particular socio-legal systems. Cartwright (2016), in her work on the health dangers associated with oil and gas fracking (hydraulic fracturing) and other occupational and environmental health issues, uses the term ‘eco-risk’ to describe the interactive process of constructing risks as they are embedded in and part and parcel of ecological systems. The environment is an integral component of the risk-milieu; the cultural appraisals of dangers are not created in an intellectual vacuum, but rather are responding to and modified by natural (and in the case of fracking, unnatural) forces that are key to how the risk is defined, understood and deployed. Eco-risks are often legally defined, substantiated and contested via the many existing socio-legal codes across the globe, further illustrating their sociopolitical presence and import.

The long-term chronic environmental crises described by McMahan, above, and Adams, below, can also be parsed through Singer's expanded notion of the term 'syndemic,' one that includes "climate change, social collapses and anthropogenic disruptions of environmental systems, and environmentally mediated class boundaries and distinctions" (Singer and Bulled 2014: 4). In this iteration of the concept of syndemic, there is an emphasis on the larger social and environmental disruptions that influence and create a plethora of new co- and multi-morbidities. This emphasis on various levels of pathogenicities is reflected in Adams's case study. Being poor, African American, and at the mercy of a variety of unscrupulous 'aid' organizations created a situation of never-ending despair in the aftermath of Hurricane Katrina.

11.4 Disastrous Recovery

Vincanne Adams

In the wake of one of America's greatest disasters, Hurricane Katrina and the breaching of levees and subsequent flooding of 80 percent of the city, New Orleans residents struggled to rebuild their lives, their homes and their city. That this was a task of extraordinary proportions was not surprising. That even after four and five years many residents were still struggling to rebuild and get out of their temporary housing was somewhat more surprising. Most surprising of all, though, was how all of this occurred despite enormous federal and state outlays of resources to 'speed up' recovery.

The story of how vast amounts of public money were spent to fuel profit-driven recovery industries that left many New Orleanians 'high and dry' is one that can teach us much about contemporary forms of market-driven governance or as some would call it "neoliberalism," and about how the machineries of disaster capitalism ultimately fail to ensure effective recovery for those who fall victim to disasters. In my book, *Markets of Sorrow, Labors of Faith: New Orleans in the Wake of Katrina*, I describe what happens when we allow the private sector to take charge of the public safety net. I argue that New Orleans' experience with disaster was not exceptional but rather exemplary for many communities experiencing disaster in the US today.

Take the case of Henry and Gladys Bradlieu, an elderly African American couple who owned their home in the middle-income neighborhood of Gentilly. Henry was a three-time Purple Heart recipient (for enduring injuries as a soldier in a US war), and Gladys was a retired clerk from city hall. Their house was flooded with up to 10 feet of water. When they returned from their evacuation to Texas three weeks after the floodwaters receded, they began living in a small Federal Emergency Management Administration (FEMA) trailer and tried to figure out how to rebuild. Temporary housing in a FEMA trailer and a check for several thousand dollars was the only effective disaster recovery help they would get from the government.

Henry and Gladys wondered how their historically safe neighborhood ended up nearly entirely underwater. Newspapers called it a 'natural disaster,' but most residents knew otherwise. The impact of the hurricane and the floods in New Orleans were hardly natural. They could be traced to both the destruction of protective wetlands in Southern Louisiana *and* the unrepaired levee system of the city, which in turn could be traced to revolving-door relationships between the Army Corps of Engineers (responsible for repairs to the levees) and large for-profit military subcontractors (Haliburton, Bechtel, the Shaw Group) who received large funds to do the government work of repairing them. For years, these companies ignored warnings about weakened levees and turned a blind eye to the environmental decline that came along with oil industries in the Gulf from which they were profiting. The wetlands south of the city had been disappearing at a rate of 13 square miles per year because of the sea channels, and by 2005 the natural landmass that would have protected the city from the harshest impact of the hurricane at landfall was gone. Whatever safety the levee system once insured for the city was long gone by 2005 as executives in these for-profit companies invested more federal resources in foreign oil wars than infrastructure at home.

The destruction from storm and floods was only the first disaster to come for residents of New Orleans. The second disaster would begin as soon as people like Henry and Gladys returned to rebuild. The second-order disaster was a result of recovery being slowed by agencies that found ways to profit on the publicly funded engines of recovery.

The first line of support for the Bradlieus, for instance, might have been insurance. They didn't have insurance in part because they had no mortgage, but even if they had, it is unlikely they would have gotten any payout. Most people only had hurricane insurance, and insurers refused to pay for flood damage. Ironically, the government supported insurance companies' claims that floods were not caused by the hurricane but from broken levees, even while the Army Corps claimed that the floods were not caused by unrepaired levees but from the hurricane. Market-driven governance works like this: the interests of corporations are placed above those of ordinary citizens who are victims of disasters.

A second option for the Bradlieus might have been to take a loan from the Small Business Administration program, a program designed during the Roosevelt years (1933–1936) to leverage Federal resources for victims of disaster. Here homeowners were invited to borrow money against their income and remaining property assets—to essentially turn their lives into a business investment. The Bradlieus didn't qualify for this. But even if they did, how could they take out a loan for a home they could no longer live in and that they would then not be able to afford? This would be “adding insult to injury,” they said. Many of their neighbors agreed. Still, this was the only option for many residents, especially renters who did not own their homes. Once again, the banks that were offered these federally guaranteed loans were able to make money on the victims of disaster.

A third option was The Road Home Program. Here was the help the Bradlieus and so many others needed. The Road Home program provided federal funds to the state-run Louisiana Recovery Authority to give homeowners financial help to bridge the gap between what their insurance paid and what it cost to rebuild, based on assessed values of their homes. Henry and Gladys applied for Road Home funds, but this proved not to be an easy process. Complaints of the poor performance of the Road Home were rampant and uniform: uneven and slow distribution, they lost paperwork, demanded documents that didn't exist, and consistently undervalued homes, especially in African American neighborhoods. After nearly two years of waiting, the Bradlieus were denied funds on the grounds they could not show title to their home. This is because they bought their home through a bond-for-deed sale, directly from the owner—a strategy used by many African American families in the 1970s when most banks refused to give them mortgages. But, when Gladys went to the Road Home office to explain this, the officer they spoke to said he had never heard of bond-for-deed sales. “How could they work in New Orleans and not know about this?” Gladys asked.

People waited years for help, living in their trailers and blaming the government for the slow bureaucracy of the Road Home program. Yet the program was not actually run by the government at all, but by a for-profit company called ICF International. ICF had designed the program for the federal government, before being awarded its management in a no-bid contract. A month prior to winning this contract, ICF held an IPO enabling stockholders to buy ICF stock at around \$12 per share. One month after being awarded the contract for the Road Home, their stock skyrocketed to over \$25 per share and continued to grow throughout their three-year contract. They repeatedly gave out millions of dollars in bonuses to their executives, and despite massive complaints from homeowners that they were not getting the help needed, ICF managed to get even more funding as they neared the end of their contract. Since for-profit companies are rewarded for their stock portfolios and their ability to retain operating capital, accountability to recipients of aid was easy to neglect. This was true even after congressional oversight hearings that exposed the failures of ICF.

By year six after Katrina, only about half of the residents who applied for Road Home funds had received any money, and most of those who did complained that it was not nearly enough to rebuild. In 2008, the Bradlieus were still trying to figure out how to rebuild, still stuck in their trailer in the front yard of their gutted home. When, that year, FEMA told them they could buy their trailer for \$25,000, they wondered why they should be asked to pay for it. Then they learn that the for-profit companies who built these trailers (Haliburton and Bechtel) and shipped them to New Orleans were paid roughly \$229,000 per trailer. Henry and Gladys Bradlieu, like others in New Orleans, felt that had they been given that amount of money instead of Haliburton or Bechtel, they would have not only been able to buy a trailer of their own, but also to rebuild their home by then.

In year four after Hurricane Katrina, people were suffering. The stress of living in a state of waiting, of being in perpetual striving toward recovery but not making progress, of being uncertain about their financial future, took a toll on most residents. Mortality doubled in the first two years after the floods, with a three-fold increase in heart attacks. By year four, people were suffering from high rates of stress disorders, including eczema, asthma, hypertension and depression. People talked about being in a “never ending funeral,” or being “on a hamster's wheel” that they could not get off, no matter how fast they ran. Suicides were rampant. We have referred to this “chronic disaster syndrome” (Adams et al. 2009).

The biggest source of frustration was with the Road Home program. Henry and Gladys petitioned over a four-year period to obtain Road Home funds. They would travel week after week to the Road Home offices, over unrepaired roads, through their still-devastated neighborhoods where there was no mail service, no streetlights, and where endless gutted or ungutted moldy homes still sat. Once at the Road Home office, they would be turned away. In 2009 Henry learned that they would be denied Road Home funds for a second time, even after obtaining affidavits from the previous owner. He told Gladys he was going to take a nap and when he laid down, he suffered a stroke that left him paralyzed and bedridden for the rest of his life. Gladys took care of him after that. Wiping his body in the sweat-soaked bed at the end of their trailer, trying to navigate the system of applications, arbitrations, complaints and denials, she was desperate, and completely on her own. There were days when she thought she could not go on.

Gladys's only hope now was with the volunteers. In the absence of effective help from federally funded for-profit companies that were making money on the disaster, many residents in New Orleans started to rebuild on their own. Coming to their aid in the first two years post-disaster were over 17,000 volunteers from all over the world. Henry and Gladys would only recover because of this help. Many of these volunteers were organized by their churches, many were simply good Samaritans. Returning residents started community organizations and pooled their resources to help one another rebuild.

Caroline, for instance, was a housewife and mother from Lakeview who returned and organized her neighborhood to dig out and help others rebuild on their own. In late 2009, she got a call from Gladys asking if she could help paint her home. Caroline said she could help her, but when she probed a bit further about the condition of Gladys's home, she said: "But she didn't even have any walls on her home. There she was, living in this trailer taking care of Henry. No walls on her home . . . Can you imagine, [Henry] a three-time Purple Heart recipient, and this was how he was treated?"

Caroline tapped into the enormous outpouring of volunteers who showed up at City Park, the Good News Camp, which hosted thousands of volunteers who camped out in tents and cooked in a communal kitchen. Every day, she would pick up the volunteers and bring them back to homes in her community. By 2009, the volunteers came from all over the country directly to her organization, a small non-profit rebuilding group that got funding from the Episcopal Diocese. She took these volunteers to the home of Henry and Gladys. She had some volunteers nailing drywall to the open studs, others cleaned up old windows so they could be put back in. One volunteer knew how to do electrical wiring, another, how to putty windows. In between these efforts, she went fundraising. Overwhelmed by the story of Henry and Gladys at the Episcopal diocese in Seattle, one parishioner shouted out, "Screw the government, I'll pay for their roof." And he did. He wrote a check for \$4,000 right there on the spot. By June 2010, Caroline said: "800 volunteers and 2 years later, we got the Bradlieus back into their home."

* * * *

Time after time, we heard amazing stories of human compassion, of how a can-do spirit and an act of financial generosity got one family, then another, then another back into their home. I volunteered, and every year brought family members, young and old, to help out. This flow of volunteers, we should recall, was not simply a spontaneous response to a humanitarian crisis. The use of volunteers, charity, and faith-based institutions to fill in the gaps in the safety net was by design. During his presidency, George Bush Sr. called upon Americans to let a thousand points of light rise up and take care of those in need. By 2005, when Katrina hit, this idea of letting private sector charity fill in the gaps in the safety net had become institutionalized. In part as a means of deflecting attention from conservative efforts to reduce government spending on safety net programs and in part an effort to shift responsibility for these programs to the for-profit and non-profit private sector, the privatization of public institutions was nowhere more visible than in post-Katrina New Orleans. Public-private partnerships like the Points of Light Institute or HandsOn Network had become institutional responses to need in America. These organizations mobilize large numbers of volunteers and service workers by leveraging federal money in order to get private and corporate philanthropy into safety net activities. The government's Corporation for National and Community Service (also set up during the Bush years) helped ensure that these public-private infrastructures received federal money but also turned humanitarian work into profit-making opportunities.

People in New Orleans who volunteered or got help from volunteers talked about “putting hands and feet to the gospel” and “doing God’s work.” But the effort exceeded that of the churches and of religion. Volunteers described their experience as creating bridges between rich and poor, Black and White, religious and non-religious, Democrat and Republican. Among those who received volunteer help and those who gave it, one could witness a revitalization of sentiments of American exceptionalism. Volunteering enabled people to form authentic communities, egalitarian and presentist, giving them a feeling of being part of a community that was larger than themselves and that spread as far and wide as the nation itself.

The sense of emotional urgency aroused by the need to help that was seen in the volunteer sector post-Katrina New Orleans was powerful. In fact, we might think of the engines of charity-based recovery as forming an *affect economy* in which we increasingly rely on volunteer and charity workers to fill in the gaps in the safety net. It is important to remember that the labor in the affect economy is motivated by an emotional sense of obligation to help. It is work that usually is unpaid, underpaid or even paid for out of pocket by the volunteers themselves.

The growth of the charity/volunteer sector in the case of post-Katrina New Orleans is exemplary of the growth of this sector in the US, as neoliberal policies shift more and more of the safety net to the private sector, including churches, NGOs and philanthropy. But the New Orleans’ experience also offers an opportunity to witness the corporatization of charity and volunteerism. Growing at a pace that exceeds faith-based charity, the new secular institutions, including philanthropy-based corporations, NGOs for volunteer and service work, are perceived as the newest success of neoliberal reforms. In the volunteer sector, we see the blurring of for-profit and non-profit, public and private, volunteerism and underpaid labor—blurrings that are seen as innovative solutions to age-old problems of socioeconomic poverty, and not just responses to disaster relief. But, as philanthrocapitalism creates opportunities to merge business strategies with the work of humanitarianism, even non-profit charities are now asked to run themselves like, and merge with, for profit businesses.

Take, for instance, the return of ICF international that so tragically bungled the dispersal of federal resources to returning homeowners post-Katrina. After its contract with the Road Home program ended, ICF turned its attention toward opportunities that would enable it to get government subcontracts to help oversee and manage support for—you guessed it—faith-based volunteer community organizations. The company that had failed to put market strategies to work for the recovery of returning residents was now going to obtain federal funding to marketize the world of grassroots, non-profit volunteer services. When Caroline heard about this, she said, “It’s enough to make me sick.” Considering that most volunteers do not get paid (and often pay to do this work), and that others are usually grossly underpaid to do service work, one wonders why companies like ICF should earn any profit at all from this.

Henry Bradlieu died in 2011, three months after he moved back into his home. Gladys held the funeral and wore a creamy white dress that Henry loved to see her in and she rented a white Cadillac for his second line, a musical funerary procession that follows after the formal burial procession. She was happy to let me tell her story so the whole world would know what went on down in New Orleans. Her story is not just about what happened in New Orleans, but about a more pervasive crisis in America as we turn our safety net responsibilities over to the private sector and leave humanitarian interventions to the demands of the for-profit market. As climate change brings more disasters like Hurricane Katrina into our midst, let us only hope that the engines of neoliberal governance are revved up to respond in ways that can be improved upon.

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The Pluralea of the Anthropocene

In a recent article, Merrill Singer (2009) discusses the need for an ‘engaged’ medical anthropology. In elaborating on this, he writes of the role of anthropologists working in collaboration with the communities they study, and with activist movements, so applying anthropological insights

to amelioration. While this might apply to any of the work we do, he relates this specifically to environmental research, noting that “in light of recognition of pluralea interactions as representing grave threats to all human futures, there is a critical need for a new applied narrative of environmental health equity and action” (Singer 2009: 815–816).

In her case study above, Vincanne Adams highlights how new forms of organizations emerged from the environmental and social devastation produced by Hurricane Katrina. In the aftermath of the hurricane, new non-profit charities took over when governmental agencies failed; for-profit businesses came about to regulate the new non-profits. Comparisons with other regions and countries that have experienced similar large-scale environmental disasters shows the cracks in the particular social infrastructures of affected areas. Who responds? Who lends a hand and why? Anthropologists have provided rich analysis of the social outcomes of disaster in relation, for instance, to the earthquake in Haiti (Farmer 2012), the nuclear pollution of Chernobyl (Petryna 2003), and the tsunami in Sri Lanka (Hastrup 2011). Large-scale environmental disasters and their human sequelae are increasingly important topics for medical anthropologists to study as we move through the Anthropocene, where the health of vast numbers of humans is negatively affected by an increasingly sullied and unnatural world.

In concluding this chapter, we return to two First Nation tribes in Alberta, Canada: the Mikisew Cree First Nation and the Athabasca Chipewyan First Nation. These two groups are located below the third-largest deposit of bitumen (crude oil) in the world—the Athabasca Oil Sands. The area, along the banks of the Athabasca River, was once teeming with wild game and abundant harvests of edible plants. It is now in close proximity to the gargantuan open pit mines in the Oil Sands, a site of near-unimaginable environmental devastation. In a community-based, participatory research study that combined Indigenous tribal knowledge and state-of-the-art toxicology, these two tribes, in conjunction with researchers from the University of Manitoba and the University of Saskatchewan, carried out interviews and environmental testing and reviewed medical records of tribal members living in the area. The results of the study indicated that eating traditional, wild foods and/or working in the Oil Sands resulted in elevated cancer and other illness rates, especially among women. The researchers found high concentrations of arsenic, mercury, cadmium and selenium in animals traditionally hunted by the tribes. The moose, ducks, muskrats and beavers living in the area are now considered to be unfit for consumption (Tyas 2014). Less wild meat and much less wild fish is consumed by tribal members now than a generation ago. Like the Sami, the Inuit and others living closely to nature, consuming wild foods is part of the cultural expression of identity and a validation of one’s place in the environment; when these foods are no longer fit for human consumption part of the culture dies. Preserving the environmental knowledge of these Indigenous groups gives us a vision not only of what life on Earth was like in the past, but, it is hoped, will allow us to imagine and create a planet that is healthy once again.

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