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Bleached! Managing coral catastrophe

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ABSTRACT

Corals have recently emerged as both a sign and a measure of the imminent catastrophic future of life on earth and, as such, have become the focus of intense conservation management. *Bleached!* draws on in-depth interviews and participatory observations with coral scientists and managers to explore the management of the corals' ecological catastrophe to come. The article starts by describing the unique life of corals, the importance of calculability in catastrophe management, and the coral scientists' preoccupation with classifying, counting, and seeing in their attempt to comprehensibly monitor corals and anticipate their decline. Algorithmic models and elaborate temporal analyses are central to this governmental project of "knowing bleaching." What happens after such bleaching events are foreseen is the topic of my next exploration, which highlights the emergence of yet more monitoring as the central coral conservation "action" in the face of the looming catastrophe. The "resilience" concept is of growing importance in the world of coral management. Since it underlines unpredictability and nonlinearity, resilience as well seems to fly in the face of any anticipatory action, instead scientifically justifying forms of inaction. Finally, *Bleached!* discusses the heated debates among coral scientists about whether to focus present actions on "buying time" for corals, or whether the only way to prevent or limit imminent coral catastrophe is to deal directly with the elephant in the room: the global regulation of climate change. I argue that, in the case of corals at least, scientific knowledge is *not* power. Quite the contrary, the real political story here seems to lie in the ways in which scientists' knowledge is neutralized and prevented from having political effects, such that it does not lead to anticipatory action to restore the ecological order. As one of the prominent coral scientists I interviewed for this project put it: current conservation efforts are akin to reorganizing the chairs on the Titanic, rather than to changing the ship's deadly course.

> Inheritance is never a given; it is always a task. It remains before us.
> —Jacque Derrida, *Specters of Marx* (2012).

1. Introduction

In the last couple decades, tropical corals have emerged as both a sign and a measure of the imminent catastrophic future of life on earth and, as such, have become the focus of intense conservation management. *Bleached!* explores this

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management of the corals' ecological catastrophe to come. The article links ecological anticipation with Big Data and statistics, affording insights into particular scientific practices of seeing and calculation.

The article starts by describing the unique life of corals and by considering the interrelations between coral bleaching and death. I discuss in particular the predicted mass extinction of coral species in the decades to come and their dramatic decline in real-time, especially in the Great Barrier Reef in summer 2016. Next, I examine the importance of calculability in catastrophe management and the coral scientists' preoccupation with classifying, counting, and seeing in their attempt to comprehensibly monitor corals and anticipate their decline. I explore the United States' federal Coral Reef Watch project, which utilizes sea surface temperatures (SSTs) and other "products," in the language of the project, in order to "see"—and foresee—major bleaching events. Algorithmic models and elaborate temporal analyses are central to this governmental project of "knowing bleaching."

What happens after such bleaching events are foreseen is the topic of my next exploration, which highlights the emergence of yet *more* monitoring as the central coral conservation "action" in the face of the looming catastrophe. I also briefly discuss other actions—specifically, coral restoration projects and their configuration within broader attempts at enhancing coral resilience. I point out that the "resilience" concept is of growing importance in the ecological community at large and in the world of coral management in particular. Since it underlines unpredictability and nonlinearity, resilience seems to fly in the face of any anticipatory action, instead providing a scientific justification for forms of inaction. Finally, *Bleached!* talks about the heated debates among coral scientists about whether to focus present actions on "buying time" for corals, or whether the only way to prevent or limit imminent coral catastrophe is to deal directly with the elephant in the room: the global regulation of climate change.

In this instance at least, scientific knowledge is *not* power. Here the distinction between *anticipatory action* (namely: actions performed so as to alter the course of events and thus the possible future) and *actions which anticipate* (merely improving data sets and producing more accurate algorithms) becomes important. As it turns out, although environmental scientists warn, monitor, and produce predictions, these actions which anticipate do not end up producing much anticipatory regulation at all.

Quite the contrary, the real political story here seems to lie in the ways in which scientists' knowledge is neutralized and prevented from having political effects, such that it does not lead to anticipatory action to restore ecological order. In this case: bleaching does not lead to retrenchment of fossil fuel mining/combustion/licenses to pollute, but rather to more actions that anticipate. As one of the prominent coral scientists I interviewed for this project put it: current conservation efforts are akin to reorganizing the chairs on the Titanic, rather than to changing the ship's deadly course.

Bleached! draws on in-depth interviews and participatory observations with ten or so coral scientists and managers, situated in the United States, Australia, and Israel. These interviews and observations are part of my larger project that interrogates the relationship between coral life and law, for which I have already interviewed 70 prominent coral scientists. The interviews in this particular segment of the project were conducted through 2015 and are supplemented with reports and news items from this period and beyond. In "Breathing Meditations" (Braverman, 2017a), I further discuss my methodological stance in my coral work, which I refer to as "immersive ethnography."

2. Corals and bleaching: an overview

Coral is a generic name for more than 2500 species of colonial invertebrates, some of whom excrete a calcium carbonate skeleton. Living within the ocean, tropical coral reefs are among the most diverse marine ecosystems on earth (NOAA, n.d.a) and provide shelter to thousands of animal, plant, and other species. Coral scientists warn that at present, corals are facing multiple stresses caused by pollution, overfishing, ocean acidification, and climate change. The scientists contend that corals act as an "early warning system" in that their alarming status represents the poor health of the oceans. If coral reefs disappear, warn the scientists, other marine life will soon follow (Vernon, 2010).

Scientists refer to the reef-building coral as a "holobiont," a holistic entity composed of an animal "host," algal symbionts (*Symbiodinium*), and bacterial microbes. The *Symbiodinium* algae is the primary producer of reefs in that they convert sunlight to biomass. The symbiosis between algae and coral is thus the foundation of the reef food chain or "trophic pyramid." Temperature increases can cause the coral holobiont to lose its pigmented symbionts and turn white, a process referred to as "bleaching" (Fig. 1). As a result, the coral often cannot build its skeleton fast enough to stay ahead of erosion and will likely die (Douglas, 2003).

In *The Reef: A Passionate* History (2014), historian Iain McCalman documents the history of the Great Barrier Reef. He also describes the global history of bleaching, pointing out that in this relatively new phenomenon was first recorded in the global mass bleaching of 1981-2. The next major mass bleaching occurred in 1997-8, killing reefs in more than 50 countries. "On the Great Barrier Reef the bleaching coincided with the warmest sea temperatures ever recorded," he continues, "Catastrophic global warming has arrived" (p. 270). In McCalman's description:

> When corals are exposed to temperatures that are two or three degrees higher than their evolved maximum of eighty-eight degrees Fahrenheit, along with increased levels of sunlight, it's lethal. The powerhouse algae that live in the corals' tissues, providing their color and food through photosynthesis, begin to pump out oxygen at levels toxic to their polyp hosts. The corals must expel their symbiotic life supports or die. Row upon row of stark white skeletons are the result (McCalman, 2013, p. 271).

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