

SATSUKI TAKAHASHI Foreword by K. Sivaramakrishnan

# FUKUSHIMA FUTURES

## SURVIVAL STORIES IN A REPEATEDLY RUINED SEASCAPE



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*Satsuki Takahashi* FOREWORD BY K. SIVARAMAKRISHNAN

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## FOREWORD

Spectacular disasters, especially those associated with nuclear energy or weapons, train attention on the fragility of human life and the devastation of nonhuman life in the most unrelenting fashion. After all, these disasters leave their deadly traces for generations, if not centuries. Precarity and uncertainty come to haunt landscapes altered by such nuclear fallout. Such is the fate of the Joban Sea in Japan, blighted by its proximity to Fukushima and the nuclear power plant located there.

This sensitive and thoughtful study began as research conducted in the years preceding the terrible tsunami, earthquake, and nuclear disaster in Fukushima. It resumed after that catastrophic event for several years and thereby provided Satsuki Takahashi a window into the world created by the Joban Sea and the fisherfolk of Ibaraki in northeastern Japan living with the excruciating uncertainties of a coastal zone deeply contaminated by the nuclear accident occasioned by the violence that possessed the sea in those fateful days in March 2011. As Takahashi shows in her fine ethnography, a decade later this uncertainty continues to pervade the way people there imagine a future, having participated in efforts to measure the damage, assess the safety, and study the viability of fashioning lives in the region.

The entanglement of environmental and human futures and the exacerbated risk and unpredictability in which these futures are caught are now the subjects of a growing literature in the anthropology of climate change, as well as the anthropology of disasters (see, for instance, Barnes 2016). When this discussion of risky futures enters a region like the Joban Sea coast, it recognizes the sculpting of the coastal landscape that was performed in the last century, during which a wealth of marine resources met intense industrial development. Disasters became a recurring feature of the seascape, as Takahashi shows, and fisherfolk developed a whole vocabulary and disposition for dealing with these events that repeatedly disrupted their lives along the coast.

Coastal dwellers learn, she writes, to survive with the seascape as they and the



sea collaborate in navigating a growing precarity shaped by poisonous industrial legacies.<sup>1</sup> Through this attention to the regional history of economic development and the vagaries of being fishers in the midst of major social and environmental changes, Takahashi elicits her concept of futurism, a definitely modern view of change as improvement that is vigorously implemented by the government and fitfully embraced by the coastal residents.

If nuclear energy was presented as a clean and safe alternative to the sullied land and seascape of the Joban coast in the mid-twentieth century, offshore wind farms became the symbols of a new vision for an ecologically prudent and sustainable future. This is the face of green modernity in the aftermath of the nuclear meltdown of 2011 and recovery from a disaster that destroyed both energy and fishing infrastructure. Takahashi is in conversation with the rapidly growing scholarly literature on the Anthropocene, as well as examinations of life amid the ruins of capitalism and large-scale development projects. She provides a study, not of apocalyptic visions or unspeakable distress but of the cautious rearticulation of hope during continuing precarity and uncertainty in an area repeatedly subject to both intensive development activity and periodic catastrophic events.<sup>2</sup>

Having carried out research in the area before the 2011 nuclear disaster, during the immediate recovery in 2011–12, and later when the region was being reimagined again for new kinds of clean energy production, Takahashi achieves a rare perspective informed by knowledge of what happened before, during, and after the cataclysmic events of 2011 to the troubled energy industries and modernizing fisheries of the Joban seascape. The book gives an account of the cumulation of industrial hazards and incidents and the recovery of fishing economy and culture against all odds, albeit with muted expectations. As a result, Takahashi shows, with particular attention to gender dynamics, how uncertainty is internalized in new perspectives that invest in hope and rebuild the fishing communities that remain committed to realizing a viable future in the area.<sup>3</sup>

In that sense she reveals the ethical, technical, and cultural striving to comprehend toxicity as historically contingent relations between living organisms, ecosystems, and institutional change. The fisherfolk of Fukushima become informed evaluators of risk as they learn all about radiation and contamination assessment.<sup>4</sup> But she also goes beyond a defensive response through what has been discussed as citizen science to engage, in the last three chapters of the book, with the new green energy projects along the coast as the fisherfolk are once again drawn into new visions of the future in a fresh wave of modernizing endeavors.

Big questions relating to energy, economic development, uncertain futures in the wake of industrial pollution and repeated disasters, coastal ecosystems, and how ordinary people think about what is now being theorized as the Anthropocene are all tackled in this book. It takes up these urgent and important themes through empathetic ethnography and clear writing. Knowledge of fisheries and sociocultural processes in the Joban Sea prefectures of Ibaraki and Fukushima gives Takahashi wonderful insight into society and ecology, as well as the political economy of futurism in this corner of Japan.

As a result, big questions are tackled and discussed with unassuming directness and engaging insight to provide a study that will enrich many debates in the anthropology of environment, disasters, coastal ecology, and energy studies. The discussion of the way precarity and hope are coproduced in the interaction between aspiration and adaptation in conditions of human and ecological uncertainty will remain a lasting contribution of this book. Repeated and growing environmental crises have generated, in the last fifty years, some of the most sustained questioning of modernity and capitalism.

Utopic and somewhat sweeping visions have also been generated for a future freed of the destructive consequences of capitalist modernity. Takahashi engages these critiques and alternatives from her vantage in northeastern Japan. She shows both local fisherfolk and nonlocal government or industry struggling to comprehend the lessons taught by the sea and its suffering at the hand of modernizing endeavors. In her account the sea remains a source of sustenance that cannot be abandoned. It also compels the adaptation of human enterprise to seek pathways to a livable future.

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This book is based on survival stories that I gathered through ethnographic field research among coastal fishing families of the Joban Sea in Japan between 2004 and 2018. By showing me the ways that they muddled through in a seascape that has been repeatedly ruined by industrial and natural disasters, they taught me that survival is a work of collaboration. Their collaboration with me was invaluable to this book project and to me personally. I am deeply grateful to them for their generosity and cooperation. I especially thank those who kindly welcomed me into their homes or other personal spaces and shared their stories, often accompanied by tea, snacks, and tasty meals. There are so many of these stories that I could not possibly include all in this book, but they greatly motivated and influenced me as I wrote the following pages.

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comments and suggestions laid the basis for significant and substantial improvements through the revision process.

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## PROLOGUE A Month after 3/11

“Can you ever finish your book?” laughed Hiroshi,<sup>1</sup> a coastal fisherman whom I have known since I was a college student in 1999. On April 11, 2011, I was visiting him and his family at their home in Minato, a coastal town in Ibaraki.<sup>2</sup> This was exactly one month after the March 11 disaster, when a massive earthquake generated a historic tsunami that struck the northeastern coast of Japan, subsequently causing one of the world’s most severe nuclear catastrophes at the Fukushima Daiichi Nuclear Power Plant. Back in 2006–7, when I conducted my yearlong fieldwork in the region, Hiroshi was one of the fishermen with whom I had worked most closely. Throughout that year, he, his family, and his fellows of other fishing families taught me a great deal about the sea, the history of coastal modernization, the politics and culture of coastal fisheries, and also the lives of fishing families depending on the industrialized seascape. After I returned to the United States in the summer of 2007, we stayed in touch through occasional email correspondence and seasonal greeting cards, but we had not seen each other in person for four years, until the disaster forced me to go back to the coast.

When I had called him a couple of weeks earlier, he suggested that we meet at his home rather than the usual fishing port. He explained that since the disaster, he rarely visited the harbor because of a fishing moratorium. At first, the moratorium was due to the acute physical damage the tsunami had caused to the harbor. The waves wrecked dozens of fishing boats and split the wharf’s concrete floor, making long and deep cracks. Nevertheless, in Minato, like in other fishing communities in Ibaraki, the extensive and visible wreckage was less severe than farther north in the disaster zone, where the tsunami had virtually washed away entire coastal towns. Thus, at first, the fishing families in Ibaraki had viewed themselves as comparatively lucky and hoped for a relatively speedy recovery. The subsequent development of the Fukushima nuclear crisis, however, prolonged the moratorium, especially after an unexpectedly high level of radiation was detected in Japanese sand lance (*kōnago*, *Ammodytes personatus*) caught off the Ibaraki shore in early April.



Hiroshi and his fellow fishers informed me that it was they, Ibaraki fishers, who initially demanded that the government test radiation levels in fish within local waters. Because of their location south of the Fukushima Daiichi Nuclear Power Plant, they immediately suspected that their waters would be more vulnerable than the ocean to the north. They knew from experience that the coastal current runs southward during the early spring and would therefore flush radioactive material from Fukushima into Ibaraki's waters. Eventually, the radiation monitoring results sadly vindicated these concerns. And so the very current that had enabled the success of Ibaraki fishers by bringing abundant marine resources and nutrient-rich waters to the Ibaraki coast now brought radioactive particles spewed into the ocean from the crippled reactors. During the extended fishing moratorium, radiation levels in fish and seawater were carefully monitored, and local fishers took turns helping to collect fish and seawater samples. Hiroshi told me that he had taken part in such sampling duties but otherwise mostly stayed away from the harbor.

When I visited Hiroshi and his family a month after the tsunami, I arrived at their house in the early afternoon and stayed with them until after dinner. We spent a good chunk of the time talking about the disaster, but we also had a lot to catch up on after four years. "How have you been?" Hiroshi asked as he was showing me into the living room. I told him that I had finally finished my dissertation and received my doctoral degree just six months earlier. I also thanked him for his generous support during my fieldwork. He smiled but did not reply directly. "So," he asked, "what're you up to now?"

I was not sure how best to answer the question, partly because I felt like I was in suspension. But I explained, to the best of my ability, that I had intended to turn my dissertation thesis into a book manuscript. But when I was about to start working on it, the March 11 tsunami and the Fukushima meltdown occurred. Immediately, I understood that it would be hard to publish a book on Japanese fishing families without talking about the unprecedented disaster that had just befallen them. I had therefore decided to conduct research on the disaster's aftermath in order to think about how I might be able to talk about predisaster stories with postdisaster ones, reconceptualizing and greatly expanding the book's subject. But as I had just begun my postdisaster fieldwork, I was not sure what the new book would even look like.

It was then that Hiroshi laughed at me, saying that I would never be able to finish my book. He was joking but also serious. He said that the conditions in the wake of the Fukushima nuclear crisis were so uncertain and unpredictable that I

would not be able to come up with a coherent conclusion anytime soon. I agreed with him. I then told him that although a book has to conclude somehow, my book's conclusion would not be the end of story. Fishing would continue, and so would my research. This was not a lie, but I knew that I probably sounded a little pretentious. Right then, Hiroshi's wife, Kimie, punctured the awkward moment with her familiar humor. "Oh my goodness, what a great business plan!" Hiroshi subsequently asked with a sarcastic smile on his face, "How many books in total are you thinking of publishing, then?" "Two volumes, perhaps," I said jokingly. "Nah," Kimie added, "you could do five, at least!" We all laughed.

When I asked how they had been for the past four years, they updated me about their three children and their school lives. They also filled me in on the major events in the lives of the other fishing families in their fishing cooperative. Some had "got off the boat"—that is, retired—but most of them had been doing well enough until the disaster occurred. As the afternoon went on, Hiroshi also told me various stories about the disaster, ranging from the day of the tsunami, cleanup efforts during the immediate post-tsunami days, radioactive contamination, consumers' fears about the nuclear disaster's effects on fish from their area, wholesalers' refusal to buy their catches, disaster compensation and lawsuits, and also some friction that had emerged in the town. At 5:17 p.m., while he was explaining the complicated compensation procedures required by TEPCO (Tokyo Electric Power Company, which owns the crippled Fukushima Daiichi Nuclear Power Plant), the whole house violently shook.

Kimie immediately turned on the TV in the living room. A loud beeping sound came from the stereo. A male anchor repeated a set of short sentences: "A large earthquake has just occurred. The magnitude is 7.1. The epicenter is Hamadori, Fukushima. There is a possibility of tsunami. Do not go near the ocean or the river." The TV screen was showing a map of Japan with the northeastern coast highlighted in red. Next to it, a "tsunami warning" sign was flashing. As soon as the tremor stopped, Hiroshi quickly grabbed his waterproof jacket and ran to the door. It was raining outside. Hiroshi did not say a word, but we understood that he was going to the harbor to take his fishing boat offshore in order to save it from an incoming tsunami. "Here," Kimie said, handing him a pack of snacks in case he had to stay offshore for a while. Exactly a month earlier, on March 11, those who took their boats offshore could not return to the harbor for twenty-four hours or more because of the tsunami debris; they later said that their hunger was particularly challenging. "Be careful," Kimie added. Hiroshi returned a quiet "yeah" and took off in his truck. The rest of us—Kimie, their three children,

Hiroshi's parents, and I—resumed quietly staring at the TV screen.

The anchor reported that the evening's quake was the biggest aftershock since March 11. A few minutes later, the tsunami warning was turned off. The anchor announced that there was no risk of tsunami. After another few minutes had passed, Hiroshi called Kimie's cell phone. He told her that he did not actually take his boat offshore and that he had just left the harbor to return home after making sure that his boat was tightly roped to the quay. I left their place soon after Hiroshi returned home. The rain was still coming down, not too heavy but hard enough to make me nervous while driving on dark streets without streetlights because they had been either destroyed or left without power since the March 11 disaster.

That night, I had trouble falling asleep in my hotel bed. The feeling of uncertainty was overwhelming. Thinking of the future, it felt as if I were still driving in darkness. A series of questions arose in my mind. What is going to happen to Hiroshi and his family? What is going to happen to the fishing industry? How long does it take for the damaged ocean to recover? How are fishing families going to survive? I knew that I would not know the answers anytime soon, but I could not help but wonder about the future. Ten years later, I still ponder the same questions. Although there are some changes in the conditions, the future remains opaque. But during the past years, I learned a lot about the future through my post-2011 fieldwork with Hiroshi and other fishers in Ibaraki and Fukushima and also through revisiting my old fieldwork that I carried out before the disaster. Based on my unexpectedly protracted fieldwork, this ethnography is about the uncertain future and people who are living with it. My goal in writing this ethnography is not to anticipate the future but, rather, to explore how people imagine, discuss, and act toward the future as they live with the ever-precarious ocean.

# FUKUSHIMA FUTURES

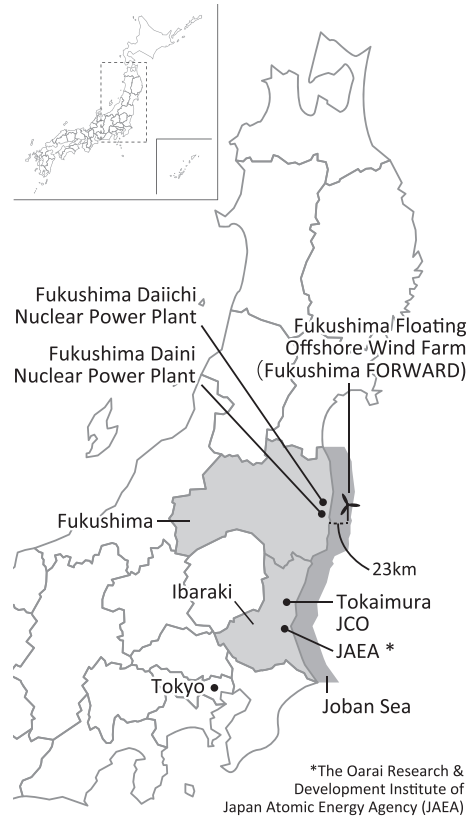


# INTRODUCTION The Removal of Fukushima Future

This book is about survival in precarious times. In particular, it focuses on the sea of Fukushima and Ibaraki in Japan, which is also known as Jōban Oki, or the Joban Sea.<sup>1</sup> Located adjacent to the Fukushima Daiichi Nuclear Power Plant, the Joban Sea suddenly became widely known to the world as one of the most fraught seascapes in the wake of the 2011 meltdown. But stories that I gathered before and after the nuclear accident illuminate that precarity had always been the condition of the seascape. This book tells two entangled yet distinct stories of survival in this milieu, based on long-term ethnographic fieldwork conducted between 2004 and 2018. One story is of coastal fishing families who lived with the precarious seascape while encountering multiple industrial disasters and other punishing challenges, ranging from declining marine resources to economic recessions. The other story is one of modernization, which the government has repeatedly introduced as necessary to ensure the future survival of coastal fishing families in precarious times, even when the source of that precarity might visibly be modernization itself. Following the two survival stories, this book asks: How did coastal fishing families experience, respond to, and live with precarity of the seascape? How did modernization play a role in shaping the precarious seascape, and vice versa? How and to what extent did modernization contribute to the survival of coastal fishing families? What do the survival stories of coastal fishing families and modernization from one of the world's most notorious seascapes tell us about possibilities of imagining more livable futures?

The Joban Sea is simultaneously abundant and ruined. The marine ecology is rich and full, thanks to the warm and cold ocean currents meeting off the coast. For generations, commercial fishing families along the shore have lived on the abundant coastal resources, and their catches were historically regarded as “the Joban material” (Jōban mono) for their premium quality at the world's largest fish market in Tokyo.<sup>2</sup> Besides its rich marine resources, the Joban Sea is also known for hosting one of Japan's largest industrialized coastlines. Ringed and

**FIG. 1.** The Joban Sea, showing four nuclear power plants and a floating offshore wind farm within the area. Created by OFFICE SA based on maps of the Geospatial Information Authority of Japan.



marked by concrete seawalls, multiple industrial port complexes, twenty-two modern concrete fishing harbors, and also four nuclear power plants in addition to seven thermal power plants, the coastline represents a microcosm of postwar Japan’s modernization genealogy. As a result, though industrialization brought capitalist development to the formerly poor coastal region, the heavy engineering of the coastal landscape has also caused substantial change in the natural habitat through tidal alteration, shoreline erosion, sand loss, and water pollution. Moreover, coastal industrialization made the Joban Sea prone to man-made disasters in addition to natural ones.

Disasters, as anthropologists have argued, are processual phenomena rather than events that are isolated and temporally demarcated in exact time frames (Oliver-Smith 1999). As Anthony Oliver-Smith and Susanna Hoffman have put it, “disasters do not just happen” (2002, 3). In the case of industrial disasters,

pollutants are produced through previous efforts of modernization (Beck 1992; Hecht 1998; Fortun 2001). In the Joban Sea, too, through historical industrial modernization, man-made disasters have been among the processes making the precarious seascape.<sup>3</sup> Looking at the present seascape in the aftermath of the Fukushima nuclear meltdown, the inseparability of precarity and disasters seems obvious, but their interconnections have been accruing for far longer than the decade since the 2011 disaster. In a highly industrialized seascape like the Joban Sea, disasters—natural and man-made alike—are in fact ordinary because they occur with frequency.<sup>4</sup>

Thus, my interactions with the seascape have been repeatedly marked by disasters since the beginning. My first visit to the Joban Sea was in 1999, when the now almost overlooked Tokaimura nuclear accident occurred. Located in central Ibaraki, the Tokaimura Nuclear Power Plant was Japan's oldest commercial nuclear generator, having opened in 1965. On September 30, 1999, the plant suffered a critical accident that killed two plant workers who were exposed to high-level radiation. The Tokaimura nuclear accident was shocking since it was the first nuclear accident that caused casualties in Japanese history. A significant amount of media attention was paid to the accident being categorized as a Level 4 disaster, one notch below that of the 1979 Three Mile Island accident on the International Nuclear Event Scale (INES) by the International Atomic Energy Agency (IAEA). In the wake of this disaster, all fishing activities in Ibaraki were immediately shut down, and the moratorium lasted for a week. Subsequently, fishing families also struggled with declines in fish prices due to consumers' fear of the risk of radiation in fish from Ibaraki, eventually resulting in a prolonged compensation lawsuit that lasted nearly five years after fishers filed the claim against the plant owner.

At the time, I was a college student at a fisheries university in Tokyo, and the accident happened right before I was going to visit the coast for a field trip as part of a course on the social dimensions of coastal fishing communities. As a result of the accident, the field trip was postponed, but we eventually visited the coastal communities a couple of months later, when the immediate effects of the accident had receded. During the field trip, through listening to local fishers tell us about the fishing moratorium and consumers' hesitancy to buy fish due to their fear of its contamination by radiation, we learned how consequential the nuclear accident had been to those people who rely on the sea. At the same time, I was also intrigued by an optimistic belief in the possibility of recovery that the fishers presented. They emphasized that the disaster was already over



and that fishing had returned to normal. Indeed, normality did seem to have returned to the seascape at the time we visited the shore.

In 2006, another major industrial disaster occurred in the Joban Sea when I was about to begin my yearlong fieldwork, during which I was planning to study community-based marine conservation. This was a rolling disaster, with three successive tanker accidents occurring in a short time near the industrial port in Minato, a coastal town in Ibaraki Prefecture, which happened to be one of my two main field sites and where I was scheduled to begin. At first, a large tanker ran aground in a typhoon and killed ten crew members, ultimately leaking substantial amounts of oil and ore into the sea. A couple of weeks later, two more tankers ran aground in another typhoon. In the wake of the three accidents, commercial fishing activities in the adjacent coastal water were entirely banned for as long as a month. Subsequently, I ended up observing the anxieties and hope that emerged among coastal fishing families in the aftermath of the tanker disaster, while exploring how those fishing families muddled through the difficult time in Minato as well as the neighboring town, which I call Hama. For fishing families, the processes of recovery from the tanker accidents involved even more time and work than had those in the wake of the Tokaimura nuclear accident in 1999. But eventually, by the time I finished my yearlong fieldwork, a sense of normality seemed to have returned.

It was almost five years after the tanker accidents that the next major disaster struck the Joban Sea in March 2011. When the triple disaster—a combination of earthquake, tsunami, and nuclear accident—happened, I was a postdoctoral fellow at a university in Tokyo, which made it possible for me to revisit the coast in early April 2011 to observe the immediate postdisaster situation.<sup>5</sup> Retrospectively speaking, given the multiple major disasters that I repeatedly encountered in my interactions with the Joban Sea, I sometimes wondered whether I simply had (and carried with me) some kind of bad luck as an ethnographer. But I eventually came to understand that, along this coast that has been heavily industrialized in the name of modernization, man-made disasters have historically been part of the seascape. For coastal fishing families living on the Joban Sea, dwelling in the industrialized sea means living with not only natural but also man-made disasters.

For commercial fishers from coast to coast around the world, dealing with natural disasters is a part of a learning process that shapes who they are (Pálsson 1991). For those living on the Joban Sea, dealing with industrial disasters is also part of the process. They expect both natural and industrial disasters, but

they cannot predict when and how the disasters will occur. Encountering one disaster after another, they have become experienced in dealing with not only natural but also man-made ones. This does not mean that they are fully prepared for the next disaster, but their past experiences teach them how to cope with new challenges. For instance, in 2006, while muddling through in the wake of the tanker accidents, more than a few men and women of fishing families mentioned to me their experiences with the 1999 Tokaimura nuclear accident. They explained that the knowledge that they had gained following the previous disaster had helped them to deal with the latest tanker accidents. It is true that the magnitude of the 2011 catastrophe is such that it deserves the frequent references to it as “unprecedented.” But as they have always done before, coastal fishing families used experiences with previous disasters to guide them in coping with the present one. Although coastal fishers themselves often emphasized notable differences between the current disaster and earlier ones, they also expressed that the ongoing nuclear catastrophe would not be the region’s last calamity. For coastal fishing families, living with disasters is part of life with the Joban seascape.

Living with the precarious sea is by no means easy. In fact, it is frequently unsettling. When I lived on the Joban coast, I learned about the hardships fishing families faced in living with the seascape, especially through everyday conversations with them, which were often devoted to various anxieties—not only about disasters but also about declining resources, stagnant fish prices, increasing costs, coastal erosion, and industrial contamination. Such conversations were especially frequent during the process of recovering from a disaster. But they also taught me that precarity does not mean hopelessness. I was intrigued by the fact that, no matter how anxiety-producing the conditions became, coastal fishing families eventually survived. That does not mean that the anxiety-producing conditions receded; indeed, anxiety over these conditions never disappears. But coastal fishing families were and still are continuously staying alive with the ever-precarious Joban Sea.

So how did these fishing families end up surviving despite long-term threats punctuated by immediate and seemingly existential crises? In order to explore this question, I revisited the field notes that I collected during 2006–7 in Minato and Hama in the aftermath of the tanker accidents as well as the ones from 2011. I also carried out ethnographic fieldwork during the summers between 2014 and 2018 in coastal towns of Fukushima. Through this long exploration, I eventually learned that coastal fishing families were not surviving in spite of precarity. Rather, my argument is that they were surviving together with the precarious

sea. Survival is, indeed, an act of collaboration (Tsing 2015, 20). In this context, the Joban seascape is precarious, not only because it has been repeatedly ruined by coastal industrialization and man-made disasters, but also because it provides unpredictable opportunities for survival. The Joban Sea is precarious because it is filled with “life without the promise of stability” (Tsing 2015, 2).

The Joban Sea is by no means healthy. But it is animated with eventful surprises.<sup>6</sup> In many ways, the survival stories of the region’s fishing families that this book narrates resonate with Anna Tsing’s insight that “one value of keeping precarity in mind is that it makes us remember that changing with circumstances is the stuff of survival” (Tsing 2015, 27). The sea is, by nature, uncertain. Fish behave differently depending on the weather, tidal flows, water temperature, and other surrounding conditions. It is fishing families’ everyday routine to coordinate their plans according to the capricious circumstances. In addition to daily changes, there is also seasonal and other cyclical precarity, which makes the seascape an especially lively space for survival. For example, some fish species—such as clams and octopuses, in the case of the Joban Sea—unexpectedly emerge in large quantity once every few years or decades and support the survival of fishing families. But because such a phenomenon results from various chains of events that occur within the ever-changing marine environment, it is almost impossible for marine biologists or anybody else to predict accurately when these large populations will emerge or how big the size of the school might be.<sup>7</sup>

Modernization has also survived together with the precarious sea, although its symbiotic relationship is more often parasitic than commensal or mutual.<sup>8</sup> It has persisted in the precarious seascape when coastal fishing families and nonhuman species of the seascape were often harmed. Although modernization projects have repeatedly ruined the seascape, modernization has continued as the state’s main policy agenda for the region, its existence repeatedly justified as the necessary means for human and nonhuman species in the blasted seascape to survive disasters and other disaster-like situations, including economic recessions and resource depletion. This use of disasters by advocates of modernization shares common principles with what Naomi Klein has called the “shock doctrine” (Klein 2007), which points to the ways that politicians and government officials use crises in order to push through unpopular political reforms such as free-market privatization. Likewise, the phenomenon that has taken shape in the repeatedly ruined seascape in Japan—what I call “surviving modernization”—highlights how crisis also provides opportunities for the idea of modernization to stay alive.<sup>9</sup>

Furthermore, the stories from the Joban Sea underscore that the survival

of modernization does not occur simply or naturally but relies on on-site collaboration between the government's field agents and those who follow their suggestions. Similar to extension agents (Escobar 1995) or NGO workers (West 2006; Li 2007), fisheries agents in Japan have historically devoted their time and effort into gaining the support of local fishing families in order to put the government's modernization agenda into practice. In fact, developing alliances with local fishing families is not an easy task, but the ordinary disasters of the Joban seascape have helped fisheries agents to eventually gain collaboration from those fishing families who struggle to stay alive, as I discuss through the contrasting stories from the two neighboring fishing towns, Minato and Hama (in chapters 1, 2, and 3). The survival of modernization is dependent, too, on the precarious seascape. In the end, while continuous modernization is often assumed and naturalized in a modern world,<sup>10</sup> the fact that modernization has survived is actually unnatural.

## THE SEA OF FUTURISM

Modernization has successfully stayed alive in Japan due largely to the extensive time and effort politicians, government officials, and extension agents devote to advocating and promoting the concept.<sup>11</sup> But why are they attracted to the concept? It seemed especially contradictory when they reintroduced modernization as a means to recover from the Fukushima nuclear crisis, even though it was unquestionable that what now imperiled the region was the result of a crucial earlier modernization project. Nonetheless, the Japanese government claimed that further modernization would support the ruined seascape and struggling fishing families in their efforts to survive in the future. This contradiction and the embedded idea of the future are together the key to understanding how to survive modernization. In the context of modernization, the image of the future is built on "futurism." As famously argued by the German historian Reinhart Koselleck, futurism is different from the concept of the future itself, which has been around since before premodern times; futurism is the future-oriented positivism that modernity produces (Koselleck 2004). Futurism, therefore, is closely associated with the developmental timeline of progress. In the name of futurism, the future is interpreted as "the newness," and the past and the present are reduced to "the oldness," which become subjects of modernization whose transformation is required to achieve the imagined future progress.

Modernization and futurism are together seductive (Tsing 2000). They provide

government officials and policy makers alike a narrative of justification for their work as a mission to accomplish the goal of making something new and better for the future. Thus, modernization advocates rely on and reproduce images of a bright future and also justify the existence of modernization by actively employing them. They are also attracted or even addicted to the nostalgia of earlier futurisms, especially those that emerged during postwar Japan's era of rapid industrialization.<sup>12</sup> That is why the building of infrastructure continues to dominate the central designs of modernization projects even as they have allegedly taken an "ecological turn," claiming to build a more sustainable future. Likewise, the environmental crisis has been translated as an opportunity for further modernization, through developing new eco-technology, rather than as a crucial moment for reflection on what a sustainable future actually means.

The Joban seascape is filled with the remains and detritus of modernization's historical efforts to design new futures. Along the coastline, in addition to the coastal industrial complexes and modern concrete fishing ports, the nuclear and thermal power plants exist as remainders from Japan's earlier modernization projects, which were carried out between the 1960s and the early 1980s. By including the construction of this power infrastructure, these projects allegedly aimed to open a new future not only for the energy industry, and therefore Japan as a modern nation more broadly, but also for the "underdeveloped" coastal region. Moreover, by referring to the heightened industrial pollution cases around the country in the 1950s and 1960s, the development of nuclear energy was also narrated as a new ecological technology that would usher Japan into a cleaner and more sustainable future (Takahashi 2014b). To take the example of Futaba, the township that invited the construction of two of the six reactors of the Fukushima Daiichi Nuclear Power Plant, the spirit of futurism was represented on a large billboard reading, "Nuclear: The Bright Future's Energy."<sup>13</sup>

In the Joban Sea area, as well as other coastal regions in Japan, industrial futurism has historically been entangled with fisheries futurism. When coastal industrial complexes were introduced in the 1960s as part of the compensation to fishers for giving up some of their fishing grounds, local fishing families received modern concrete fishing ports and subsidies allowing them to upgrade from small rowboats to bigger motorboats. The modern ports are typically surrounded by seawalls and include a wharf as well as a local fish market, which allows fishing families to land and sell their fish within their own port. Therefore, though losing fishing grounds was a painful blow, those fishing families largely accepted the compensation, anticipating greater gains from modernizing their

fishing infrastructure. Similarly, when the government promoted the development of nuclear power reactors in the 1970s, local fishing families accepted modern marine fish hatcheries as part of the compensation for their willingness to accept the proximity of, for example, the newly constructed Fukushima Daiichi Nuclear Power Plant. In fact, the Fukushima Fish Nursery Laboratory—which was built in the town of Okuma, where the initial four units of nuclear reactors are located—was one of the nation’s largest and most cutting-edge marine fish hatcheries. Just like the nuclear reactors that were presented as emblems of the region’s bright future, the marine fish hatchery was also introduced as a means to open a better and sustainable future for the seascape, as I learned when I visited the facility in 2004.



On a sunny summer day in July 2004, I was in Okuma in order to visit the Fukushima Fish Nursery Laboratory both as a fieldworker to conduct preliminary research for my dissertation and also as a translator for ninety fisheries experts from around the world who were on a field trip as part of an international conference on fisheries management held in Tokyo. Given that year’s conference theme—“What Are Responsible Fisheries?”—the fish laboratory seemed to be an ideal location for the excursion. Our itinerary for the afternoon was to visit and learn about the fish laboratory, where marine biologists bred fish juveniles of more than eighty species in their hatcheries.

“It feels nice,” said a professor from Indonesia in front of me as we were getting off our large charter bus. The early-afternoon air in coastal Fukushima was summery but fresh, especially compared with unbearably hot and muggy Tokyo, from where we had left in the morning. In the middle of the laboratory’s spacious parking lot, a Japanese fisheries professor—also the conference organizer and the excursion’s tour leader—spoke to the crowd of international fisheries experts through a handy megaphone. We were in Fukushima Prefecture’s fish hatchery, as he explained, and we were going to break up into groups and take a tour of the facilities. Among many marine fish hatcheries in Japan, the one in Fukushima was easily the largest facility that I had ever seen.

A young ichthyologist who worked for the hatchery escorted our group. He first took us to the twelve-acre front yard next to the parking lot. In that space, there were a few dozen lines of long, rectangular concrete tanks that looked like tall stone coffins. The ichthyologist explained to us that they raised abalone

and sea urchin juveniles in as many as 160 concrete tanks. Next, the young ichthyologist took us into a 7.5-acre building that looked like a large indoor sports stadium. After disinfecting the soles of our shoes in chlorinated water, we entered the facility. Inside were two dozen large, round concrete pools in which were kept thousands of flounder juveniles, organized by size. In one corner were also two dozen plastic containers for growing plankton for feed. Gathering us in front of one flounder tank, the ichthyologist gave us a mini-lecture about the facility, opening with the proud announcement that his laboratory was one of Japan's most advanced hatcheries and that it played an important role in achieving Fukushima's sustainable fisheries. He also told us that his laboratory could produce fish juveniles three to four months faster than the natural speed because it used thermal discharge from the neighboring Fukushima Daiichi Nuclear Power Plant. According to him, the warmed seawater speeds up not only the spawning cycles but also the growth of fish juveniles. In addition, he also emphasized that the method of recycling thermal discharge was an advanced, environmentally conscious technology. Thermal discharge is normally considered to be an environmental hazard because it increases the temperature of coastal waters adjacent to a power plant.<sup>14</sup> But by recycling it, the fish hatchery transforms hazardous wastewater into a useful resource. As I was translating his explanation into English, a few fisheries experts expressed their admiration.

At that time in 2004, none of us expected that the fish hatchery would end up with a famously tragic future, and no one even mentioned any risk of a future accident. To the contrary, since the facility had opened in 1982, the laboratory had been considered a symbol of the area's bright future, with a positive reputation nationwide. For example, in 1999, when an annual national fisheries conference, the National Convention on Nurturing the Abundant Ocean, was held at the fishing harbor of Matsukawaura in northern Fukushima, the nuclear fish hatchery as well as local fishers received the highest honor for their efforts to promote Japan's modern marine conservation. As the highlight of the event, Japan's emperor and empress made a speech, praising local fishers for their contributions to promoting sustainable fisheries. After the speech, the royal couple took a few steps onto a custom-made wooden platform on the quay, which was built specially for this occasion, and gently released a bucket of hatchery-born fish juveniles raised at Fukushima Fish Nursery Laboratory into the ocean. The slogan of the year's fisheries convention read, "Nurturing the Ocean, We Build a Dream Bridge to the Future." The embodied futurity of the nuclear fish hatchery was unmistakable.

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But the future is, indeed, unpredictable. On March 11, 2011, the tsunami utterly destroyed not only the nuclear power plant but also the adjacent fish hatchery, washing away the buildings, the tubs, fish, and six staff members. In the aftermath, the hatchery exists only as a ruin. The only thing that remained on the site was the frame and the rooftop of the stadium-like building, where thousands of flounder juveniles were once nurtured. At sea, the nuclear substances released from the crippled nuclear reactors further damaged the precarious seascape while threatening the future survival of fishing families. A couple of months after the catastrophe, a fisheries official from Fukushima Prefecture told a reporter from the *Yomiuri*, Japan's most popular daily newspaper, "Until the accident, we and the nuclear power plant co-existed in peace and prosperity" (Miura 2011).

But it did not take a long after the 2011 accident for the government to introduce a new direction for modernization. Nine months after the nuclear meltdown the government announced a project of a public-private consortium for building the world's first floating wind farm off the Fukushima coast. The consortium leaders proudly claimed that their project would open yet another new future for not only Fukushima and Japan but also for the nation's fishing industry. On June 20, 2012, while the consortium began its mission to build the new future, the University of Tokyo—one of the consortium members—celebrated the innovativeness of the new ecological technology in an online article on their school's website. The headline of this article reads: "Tomorrow's Wind Blows at Sea" (*Ashita no kaze ga umi ni fuku*) (University of Tokyo 2012). A year later, in June 2013, this notion of building the future would be reiterated when the consortium introduced the public to their first floating windmill, named Fukushima Future (Fukushima Mirai).

The history of the Joban seascape reminds us that futurism is, indeed, "a modern cultural tradition" (Pels 2015, 782; see also Koselleck 2004; and Harding and Rosenberg 2005) and that it continues in the present. In many cases, we see this tradition in infrastructure: transportation systems (Latour 1996), nuclear power plants (Hecht 1998), dams (Tilt 2014), and agricultural and fisheries extension facilities (Escobar 1995; Takahashi 2014a, 2018; Fukunaga 2019; Swanson 2022). Therefore, by looking at infrastructures, we can learn a great deal about aspirations, anticipations, and imaginations of the future that are shared among the people involved (Appadurai 2013; see also Gupta 2015, 2018). In recent years, more projects of futurism have made "an ecological turn," emphasizing that their



FIG. 2 Fukushima Future, the first floating turbine in the Fukushima offshore wind farm. Photo by author.



innovations—for example, electric cars and renewable energy—are designed to build the new sustainable future. But by and large, such eco-futurism projects have continued to be preoccupied with the familiar idea of progress and thus have employed typical developmental procedures by exploiting the local landscapes and seascapes in order to produce electricity. As a result, “green” energy projects are often short-lived, as seen with a large wind park in Oaxaca, Mexico, which could cause further delay in dealing with climate change into the future (Howe 2019; see also Boyer 2019). The ill-fated Fukushima offshore floating wind farm would also become one such ephemeral eco-futurism project.

Futurism implies newness, but the imagined future in eco-futurism projects is built on nostalgia for the usual. Eco-futurism projects aim at sustaining the accustomed capitalist lifestyles through technologically fixing the current ecological problems without changing conventional energy-dependent practices (Hughes 2014). But there is no way to “fix” the Anthropocene (Thomas, Williams, and Zalasiewicz 2020). Nevertheless, the stories from the Joban Sea suggest that there is still hope in the damaged seascape. Therefore, instead of dreaming about

the fictional future, this book argues that it is important to reorient ourselves to be truly present, gazing at the current problems and considering ways to collaboratively survive with the damaged landscape and seascape.

## HOPE IN THE PRECARIOUS SEA

This book's title, *Fukushima Futures*, is inspired by the name of the first windmill of the Fukushima's floating wind farm for two reasons. One is that it represents the survival of modernization in Japan and also the limits of futurism. The other is because I wish this book to help open our imaginations for "more livable futures" (Haraway 2016). I hope to do so by both making visible the limits of futurism and nurturing our hope for "collaborative survival" (Tsing 2015, 20) in the repeatedly damaged seascape between human and more-than-human others, including not only fish and other marine species, tides, waves, wind, rain, seabed, beaches, but also man-made objects such as ports, hatcheries, energy plants, wind farms, and other marine infrastructure.

The Fukushima Daiichi Nuclear Power Plant accident, as one of the world's worst man-made disasters, left in its wake substantial debates on the Anthropocene, the new geological epoch in which the earth's natural systems have been changed by harmful human activities (Ghosh 2016; Morton 2013; Scranton 2015; Tsing, Swanson, Gan, and Bubandt 2017). In many ways, people across the world projected images of postdisaster Fukushima onto those of the doomed future of the Anthropocene. Media reports from Fukushima along with iconic images—such as the demolished nuclear power reactors, people in hazmat suits and masks, Geiger counters over fresh vegetables and seafood, mounds of black bags filled with radioactive soil, and abandoned houses in evacuation zones—were undeniably unnerving and terrifying, even apocalyptic. The Japanese disaster also affected the energy policies of several countries, including Italy and Germany, which quickly made decisions to reduce their reliance on nuclear power, gradually shifting to renewable energy sources, in order to reduce the future risk of causing another Fukushima-like catastrophe. In Japan, though the antinuclear movement was not as active as it was in many European nations, public and policy support for adapting more renewable energy sources grew in the immediate aftermath of the Fukushima accident. Largely for this reason, the Japanese government introduced the floating wind farm off the damaged coast as a utopian antidote to the seemingly doomed future of Fukushima and, more broadly, of the troubled earth.

The national project of Fukushima Future eventually stalled, largely due to the reduction of government support, with repercussions that ripple through the accounts that unfold in this book. This failure suggests perhaps that the future of the Anthropocene remains opaque, as does the future of Fukushima itself. But living in limbo with the ever-precarious seascape is not necessarily hopeless. Rather, the condition of suspension allows us to become attuned to unforeseen possibilities, which we often overlook when we are preoccupied by our concerns with the expansion of anthropogenic powers (Choy and Zee 2015; see also Kirksey 2015). Although many postdisaster utopias are, in fact, short-lived, some of them may survive in different forms and suggest future hope even though their scales might be small and localized (Morris-Suzuki 2017). Moreover, stories of coastal fishing families in the Joban seascape before and after the 2011 disaster tell us that surviving in the ever-precarious sea depends on collaboration not only among humans but also with more-than-human others—including oceanic fauna and flora, water currents, winds, and forth—which are all part of the dynamic oceanographic milieu. Such oceanographic collaborations are hard to plan in advance, and they often emerge accidentally. But in such precarity, I place hope. Through meditating on the collaborative survival stories of coastal fishing families in the Joban seascape, this book suggests possibilities of more survivable futures, which are different from familiar narratives of apocalyptic or “salvific futures” (Haraway 2016).

The Joban seascape remains precarious, simultaneously hopeful and anxious. In 2022, as I am writing this introduction, the Fukushima nuclear crisis is still lingering, though radioactive effects on the coastal waters seem to have been reduced. According to the most recent official reports, the amount of radioactive materials in all the tested fish samples has been consistently lower than the government’s safety standard since April 2015, with the majority of them registering as “N.D.” (Not Detected) (Fisheries Agency n.d.). In December 2020, given the satisfactory results of radiation monitoring, local fishers in Fukushima made a collective decision to end the fishing moratorium with limited pilot operations and to move toward the reopening of “normal” operations. A few months later, on March 31, 2021, the limited pilot operations were officially discontinued, and coastal fishing families began working toward gradual recovery of normalcy, while muddling through the additional challenges caused by the COVID-19 pandemic, which had substantially reduced fish sales.

While the reopening of fishing in Fukushima encourages local fishers, the future of coastal fishing remains uncertain, especially considering the issue of

nuclear wastewater from the crippled nuclear reactors. During the ten years following the immediate aftermath of the Fukushima nuclear accident, the Japanese government repeatedly proposed a plan to release low-level nuclear wastewater into the sea, claiming that the potential risk to marine species is minimal or zero, and also that the ocean-dumping is necessary due to the scarcity of storage space for continuously accumulating wastewater (Ministry of Economy, Trade, and Industry 2020). But local fishers sustained their strong opposition to the proposal. Local fishers' concerns are twofold. First, it is hard for them to trust the actual safety of the dumping. Their skepticism toward the government and TEPCO regarding safety measures is understandable, especially considering that they have been betrayed once before when they were informed belatedly about the leakage of high-level nuclear wastewater into the sea. Additionally, even if low-level nuclear wastewater is actually safe, local fishers worry justifiably that ocean-dumping of nuclear wastewater would further damage consumers' trust in the safety of fish landed in the area, continuing to drive down the future value of their fish. But eventually, in April 2021, despite local fishers' remaining strong opposition, Prime Minister Yoshihide Suga announced an executive decision to put the water release plan into practice, starting in 2023.

In December 2020, in the midst of heated discussions on the release of wastewater and the reopening of regular fishing operations, another headline regarding the future of Fukushima leapt into the news. The Ministry of Economy, Trade, and Industry made an announcement that it had decided to discontinue the Fukushima offshore floating wind farm project and to remove all the remaining windmills, including Fukushima Future, from Fukushima's offshore waters by the end of March 2022. The spokesperson explained that the government had to remove the entire offshore wind farm because maintaining the project was too costly and unprofitable. Those coastal fishers who imagined the possibility of a survivable future together with the offshore wind farm were disappointed. But, as they told me, they still retain hope in staying alive together with the precarious Joban seascape.

Gazing at the Joban seascape in limbo, this book reflects on our attitude toward the future. The story of "surviving modernization" demonstrates that modernization itself has survived by generating hope through promising sustainable progress, in which the seascape itself is tamed and stabilized, reducing the precarity of life within and around it. But in contrast, the stories of surviving fishing families remind us that hope of more survivable futures exists within precarity (see also Allison 2013). They also show us that hope can emerge in

the blasted seascape (see also Kirksey, Chapiro, and Brodine 2014). If we define precarity as “life without the promise of stability” (Tsing 2015, 2), coastal fishing families living on the Joban Sea have long, historical experience with it. As they often said to me, the ocean is by nature precarious. The wind, currents, and fish are all capricious, changing their movements in every moment. They have also survived multiple disasters, not only natural but also man-made ones. Their survival stories suggest that possibilities of more livable futures exist in the Joban seascape, no matter how doomed the future seems to be.

## OUTLINE OF THE BOOK

This book traces the survival of modernization and fishing families and their entanglements through stories that I gathered based on three stretches of ethnographic fieldwork along the Joban seascape. The first segment reflects material collected during 2006–7, when I spent a year in two coastal town, Minato and Hama, in Ibaraki Prefecture (chapters 1–3). The second draws from material from 2011, in the immediate aftermath of the triple disaster of earthquake, tsunami, and the Fukushima Daiichi Nuclear Power Plant accident, when I carried out fieldwork in Ibaraki, Fukushima, and Tokyo (chapters 4 and 5). Finally, I use material collected from 2013–17, when I focused primarily on the Fukushima offshore floating wind farm and those fishers who were associated with the newly introduced postdisaster futurism project (chapters 6 and 7).