

Seismic Histories and Rupture Probabilities: Photographic Perspectives on Japanese Earthquakes

Introduction

[Title Image] No matter how clear our aims and intentions are as a photographer, however thorough and scholarly our research may be before venturing out into the field, we can never know how the world will reveal itself to us in the moment of our encounter with it. As a practitioner, I am interested in the photographer's interaction (or intervention) with sites that have been selected for their significance beyond the immediate present. My photographs are always about the combination of layered history within the chosen site and my own contemporary viewpoint at the time of making the photograph. It is this experiential perspective that I hope to describe in this presentation.

It is therefore necessary that this talk is given from a personal perspective of someone who is trying to use photography to represent not only the contemporary surface of the landscape, but also to connect and refer to earlier histories and future probabilities. I hope that my talk will provide a sense of the uncertainties, instabilities and leaps of faith that are involved in trying to build a meaningful piece of work in difficult and unpredictable circumstances.

This presentation will revolve around a pivotal period in my practice as a photographer. [Kamaishi Wave] Finding myself caught up in the 2011 Great East Japan 'Tohoku' Earthquake and the tsunami that resulted from it was one of the most challenging and difficult experiences that I have encountered. The impossibility of representing the magnitude of these events in photographs was immediately clear and the subsequent challenge of finding an appropriate means of contextualising and disseminating the photographs that I made are themes that I hope this presentation will begin to tackle.

[Lindow] With the benefit of hindsight, it becomes clear that much of the work that I have produced in the past has emerged from a fascination with the photograph's ability to be specific, evidential and descriptive in the immediate present, while also generating echoes of the past and future and provocations for the imagination. The complex temporal stratigraphy of the photograph and its relationship with place is at the heart of my visual practice.

Opened Landscape: Lindow, Tollund, Grauballe

[Lindow] In order to establish a basis for the work I have made in Japan, it is useful to inform the reading of those photographs by briefly outlining the related pre-occupations of some previous bodies of work. *Opened Landscape: Lindow, Tollund, Grauballe* is a series of photographs that I made in the landscape close to my childhood home. In the mid-1980s, this peat-bog landscape became a site of great archaeological significance when the preserved body of Lindow Man (an Iron-Age human sacrifice) was discovered there. [Lindow Man] My photographs were

concerned with the layering of time, memory and personal experience. [Lindow] The images describe a surface littered with the remains of a Neolithic woodland, exposed through the intensive and destructive process of peat extraction that had earlier revealed the 2000 year old body.

[Lindow: discovery spot] I was interested in the parallels between the scrutiny of the archaeologist and the scrutiny of the photographer. The large format 8x10inch colour negative was able to harness a range of detail across the picture plane that is beyond the ability of the eye to singularly resolve – photography's descriptive and evidential qualities enable the viewer to participate and interact with a detailed range of information that is presented without exaggeration or overstatement. Each visit to the site was an opportunity to gather evidence – to preserve and record a place that was being destroyed. Yet the peat bog also offered the potential for discovery and transformation.

Ultima Thule

[Iceland: Geological map] With an increasing interest in archaeological analysis of stratigraphy and a growing interest in geological histories and mapping, my work began to develop connections to similarly 'apocalyptic' landscapes where human histories interacted with processes and phenomena of the earth's surface.

My work in Iceland took its starting points from the exploratory journey of Pytheas in 325 BC from the Greek colonies of the Mediterranean to the far north western edges of the known world (to a place – Ultima Thule – where as Pytheas remarked 'the sea congeals' or freezes). Prof Barry Cunliffe (Oxford University) suggests that this far frontier was Iceland.

[Ultima Thule: sequence] Again, the series *Ultima Thule* uses photography to meticulously describe the visible surface of the contemporary landscape in a state of transformation through volcanic activity and glaciation. Situated across the boundary of the Eurasian and North American tectonic plates, Iceland is a laboratory of geological renewal (as we can currently see in the volcanic eruptions taking place between the Askja and Grimsvotn volcanoes where these photographs were made). In the 1960s, this area was also used for geological field training by NASA astronauts, before the first Moon landing. Like the *Opened Landscape* photographs, *Ultima Thule* strives to combine precise photographic description in uncertain territories of potential transformation, volatility and change. These apparently stilled spaces have the potential for dramatic (even catastrophic) change from beneath the surface or beyond the horizon.

A Catfish Sleeps

[Iceberg] In 2009, I was awarded a commission to make a new piece of work in Japan. The initial aim of the project was to transpose my fascination with geological phenomena in the seemingly uninhabited volcanic deserts of Iceland to a territory in which this volatile geology interacts with one of the most populated spaces on the planet. I wanted to see if the photographs I would make of the contemporary landscape might in some way demonstrate this geo-cultural interaction. [Namazu-e] As part of my research for the project, I became aware of

the Japanese Namazu-e (Catfish drawings) that presented the catfish as the source of major earthquakes. Before the great earthquakes of 1854-55 the Namazu-e (catfish drawings) depicted the giant catfish as something to be feared. Yet afterwards the catfish was often shown as the source of redistributed wealth and regeneration. All of these things fed into my ideas for the work, but the visual content of my project was uncertain.

[Japan: tectonic maps] In preparation for the project, I tried to pinpoint a series of locations that were significant in geological terms – sites of volcanic or geothermal activity, historical sites of seismic catastrophe or those areas that were thought to be under threat from future seismic rupture. This information came principally from a series of geological and seismo-tectonic maps and this Rupture Probability Map of Japan. Japan is positioned in a subduction zone where the Eurasian Plate, Philippine Sea Plate, Pacific Plate and Okhotsk Plate are colliding – the Pacific plate subducts beneath the Philippine Sea Plate and both plates also descend beneath the Eurasian Plate. The triple junction of these boundaries is directly beneath Mt Fuji. The inevitable result of these tectonic shifts is volcanic eruption and regular major earthquakes. For decades, Japan's seismologists have expected 'the big one' – the potential combination of the same fault that caused the 1923 Great Kanto Earthquake, which killed 140,000 people (which recurs every 80 years or so), and the fault that caused the devastating earthquakes of 1854 and 1855 (c.150 year frequency). [combined map sketch]

[Catfish sequence] The photographs that I made in *A Catfish Sleeps* were my first attempt to consider the histories and probabilities of these phenomena. I photographed sites from the far North of Hokkaido [Shiretoko] to the far south of Kyushu [Sakurajima] and many places between. The possibility of earthquake was something abstract beyond the material subject of the photographs and, as such, the central idea of the images remained elusive and invisible. [Shizuoka sequence] My photographs in Shizuoka, for example, show only the architectural normality of a suburban district. Yet they are charged with the knowledge that this area remains extremely vulnerable to earthquake and tsunami, positioned as it is at the southern end of the Itoigawa-Shizuoka tectonic line and close to the Suruga Trench where the future Tokai Earthquake is predicted.

[Osorezan] Other images in the series show sites of religious pilgrimage and spectacle [Aso-san]. At Beppu, the extraordinary geothermal springs have become a series of kitsch representations of 'Jigoku' (or Hell) [Oniyama Jigoku, Umi Jigoku, Chinoike Jigoku], for example Monster Mountain Hell, Sea Pond Hell and Blood Pond Hell.

I also wanted to describe some of the ways that we attempt to absorb these histories into memory or counteract the nature of these potential events through technological ingenuity. [Nojima Fault] As part of the series, I made a sequence of photographs near Kobe (where the 1995 earthquake killed more than 6400 people). On Awaji Island a 140m section of the Nojima Fault that caused the earthquake has been preserved and is now housed inside a museum of the earthquake. [E-Defense] Outside Kobe, the National Institute of Earth Science and

Disaster Prevention has built a research facility called E-Defense – the world’s largest earthquake simulator – in which architectural structures are developed and tested to withstand future high-magnitude earthquakes.

[Tokyo sequence] Throughout the project, I made photographs in Tokyo that focused upon infrastructural and architectural sites that were either vulnerable to earthquake or that were designed to withstand the forces of the earth’s movement. The final image of this series was made at the Tokyo Sky Tree – the world’s tallest tower – under construction. [Tokyo Sky Tree] It seemed incredible to me that Tokyo was building such a monumental structure with the sure knowledge that it would be subjected to major earthquake in the near future. It is a statement that declares a great confidence that it is possible to use technology to work flexibly with natural forces – the Sky Tree would ‘sway – like a tree’ as someone would later remark to me.

Tohoku 2011

A Catfish Sleeps seemed incomplete to me and I was searching for ways to expand the reach of the project to other territories – perhaps beyond Japan. The San Andreas Fault was often suggested to me as the next logical site to make work, but this seemed rather too obvious. A friend in Portland, Oregon (Chris Rauschenberg) spoke to me about the growing awareness of the potential for future megathrust earthquakes in the NW Pacific ‘Cascadia’ region of America (the coast that runs parallel to Mt St Helens volcano). This public awareness was, in large part, informed by the research undertaken by Prof Brian Atwater (University of Washington/USGS) and Prof Kenji Satake (University of Tokyo, Earthquake Research Institute). [Orphan Tsunami] This research revealed that in 1700 a massive megathrust earthquake had struck the NW coast of America. It caused a trans-pacific tsunami that reached the eastern and southern shores of Japan. [1700 tsunami sites] This tsunami (which had apparently occurred in Japan without an accompanying earthquake) was recorded in Japanese texts in the towns of Kuwagasaki, Tsugaruishi, Otsuchi, Nakaminato, Miho and Tanabe. [Texts & Dendrochronologies] This historical seismic connection between Japan and America (described in *The Orphan Tsunami*, University of Washington/USGS) was fascinating to me and I wanted to find ways of building this history into the work I had made in Japan.

My intention, when returning to Japan on 8 March 2011, was to travel to those coastal locations to photograph contemporary landscapes that contained this invisible history of earthquake and tsunami. [location map sketch] The NE coast of Tohoku (as you can see from my rudimentary map) was not included in the first project in 2009, so this was a way of expanding the scope of that work in these areas.

[Tokyo Sky Tree] Before travelling north, I spent a few days in Tokyo, and on 11 March 2011, I decided to return to the Tokyo Sky Tree to re-photograph this extraordinary building in the final stages of its construction (now towering almost 634m high).

Description of the earthquake

I was not fully aware of the enormity of the events elsewhere until later in the afternoon. The transport system was completely shut down in Tokyo, but otherwise things appeared to be continuing relatively uneventfully. [Sky Tree from Sumidagawa] I decided to circle the Sky Tree (as the epicentre of my earthquake experience) before starting the long walk across Tokyo from Sumidagawa to Yoyogi YHA where I was staying. In the early evening, I stopped to Skype home (my wife had just woken to the news of the terrible events that had occurred in Japan). I then sat and watched the shocking footage of the tsunami on the television. I was, of course, deeply shocked at the magnitude of the disaster and the sudden realisation that the Iwate coast that I had planned to photograph had become a site of contemporary catastrophe and loss of life.

In the days after the earthquake, it was impossible to travel north – transport infrastructure was shut down, army and rescue were given priority, there was also the Fukushima exclusion zone in place. I also knew that I had no role as a photojournalist in these circumstances. Despite the fact that this kind of event was precisely what my work had referenced previously, I felt a profound immobility and a sense that my previous imaginings were now entirely inappropriate in the context of real and immediate devastation, destruction and death. I also knew, however, that it would be ridiculous for me to stop working in these circumstances, if I was at all serious about my research enquiry. History – previously abstract, imagined and invisible – was now punctuating the immediate, visible present and I felt that it was necessary for me, as a ‘photographic recorder’ to find a way to respond. [1923 Seismograph] I made a small series of photographs at the Earthquake Memorial Gardens and Museum for victims of the 1923 Great Kanto Earthquake.

[Hiwatari sequence] Before the earthquake happened, I had hoped to photograph the annual Hiwatari Fire Walking Festival beneath Mt Takao on 13 March (two days after the earthquake). This became a powerful and symbolic event in light of the tragic events that were taking place further north and the threat of nuclear meltdown at Fukushima. Hundreds of ordinary Japanese families followed the monks barefoot over the burning ground in the ritual ceremony that seemed to express a determination and courage to continue in the face of disaster and pain.

[Tokyo sequence] On Monday 14 March I began to make photographs on the streets of Tokyo. Nothing appeared out of the ordinary and the city seemed much the same as before – the earthquake had (here at least) remained largely invisible. I photographed in the central financial district around Edobashi (Japan Bridge) and managed to gain access to the Tokyo Stock Exchange on the first day of trading after the earthquake. I continued to make photographs that showed the disruption to the transport network and some images that showed the effects of electricity saving time in the city. [Sumidagawa cracks] There were occasional indications of earthquake damage (such as this building in Sumidagawa).

It was a disorienting experience. There was sensational and frightening news from home regarding explosions at Fukushima (and the potential radiation spike in

Tokyo), coupled with a calm normality on the ground. As the days passed I increasingly felt that it was necessary for me to find some way of recording the effects of this unprecedented natural disaster in the places that I had originally intended to photograph on the Iwate coast. This pressure to record the facts as I saw them marked a significant shift in my own practice as a visual artist. I wanted to maintain and apply the clarity of description that had characterised all of my earlier work, but the sense of responsibility and sensitivity to the harsh realities of the situation demanded a more sober perspective. [Ofunato]

[Iwate sequence] In a sense, I recognised that there was no space for the imagination in these circumstances. I sought to make images that were unflinching in their gaze but which did not overstate or exaggerate the facts. I strived for objectivity, knowing that my position was inevitably subjective, involved, emotional and personal. I knew as I was making the photographs that they would not – could not – represent the incomprehensible scale of the disaster. The limits of the tightly organised and selected reality within the frame are obvious when describing events such as these that are beyond description. Fragmented and limited, the inadequacy of the record that the photographs represent, is something that I continue to struggle with in the further dissemination of this work.

The strategy that I decided to adopt was to make photographs that were centred around the 1700 'Cascadia' tsunami locations in Iwate prefecture – one of the most severely affected regions in the 2011 tsunami. Kuwagasaki, Tsugaruishi and particularly Otsuchi became the main focus of my attention in the aftermath of the tsunami. I also made photographs in Yamada, Ofunato and Kamaishi on the same coastline.

Despite my awareness of the limitations of this photographic record, I made every effort to build a significant and detailed description of the phenomenal effects of the tsunami. I drew upon the work I had made in relation to archaeology in the *Opened Landscape* series a decade earlier – striving to simply 'circle the space' (as my teacher Thomas Joshua Cooper had encouraged me to do). The scale of the destruction was indeed 'spectacular' in many ways, but it was also repetitive, persistent and overwhelming – the endlessly repeated physical evidence of Nature's complete indifference to everything on a human scale. In places that would previously have been characterised by a carefully organised sense of discreet human order, the all-consuming devastation was vulgar, ugly and monotonous. My task, as I saw it at the time, was to collect evidence that would describe the indiscriminate violence of Nature. I wanted to acknowledge our collective human insignificance in the face of such force. I persistently tried to maintain the balance in my mind between the incomprehensible enormity of the immediate visual present and its temporal context within deep geological time.

I still don't fully know what the meaning and value of these photographs is. Certainly, in Japan, they can perhaps only serve (when shown on their own) as an unwelcome reminder of pain and tragedy. However, I hope that when they are combined with other images and other narratives they will form a vivid and

enduring visual record of the Earth's power and volatility and our human predicament in relation to it.

CHIKYU

Ultimately (if sufficient funds can be raised), the photographs from 2011 will be published within a bookwork that includes all of my work in Japan from 2009 onwards. The book will aim to contextualise the events of 2011 within a broader temporal narrative of historical, geological and cultural perspectives. [\[Nankai map\]](#) I am in the process of developing this wider context of 'deep time' through a new series of photographs made at the fault boundary of the Philippine Sea and Eurasian tectonic plates, in the Nankai Trough, south of Japan (the source of historic and predicted catastrophic earthquakes).

In 2012, I exhibited the first two stages of the project (*A Catfish Sleeps* and *Tohoku*) at the European Geosciences Union Assembly in Vienna (with an audience of 11,000 geoscientists). This led to an invitation from the *Centre for Deep Earth Exploration* (CDEX) and the *Japan Agency for Marine-Earth Science and Technology* (JAMSTEC) to make a series of photographs aboard the Research Drilling Vessel CHIKYU (meaning Earth in Japanese). [\[Chikyu\]](#) CHIKYU is the world's largest deep ocean drilling vessel and it is dedicated to facilitate scientific enquiry at the edges of the Earth's tectonic plates.

The recent CHIKYU expeditions include the 2012 *Japan Trench Fast Drilling Experiment* (JFAST) and the *Nankai Trough Seismogenic Zone Experiment* (NANTROSEIZE). The JFAST expedition was made in direct response to the 2011 Tohoku Earthquake. The scientific aim was to retrieve core samples from the subduction boundary of the Pacific Plate and Eurasian Plate at the Japan Trench, drilling directly through the fault that caused the earthquake. A dedication to the 3/11 victims was written on the drill head before the 7000m drill thread descended into the earth's surface. This dedication was declared with the ambition to provide the scientific explanation of the extraordinary seismic upheaval that had taken place – an effort to understand the mechanics of the processes involved.

The NANTROSEIZE experiment has been taking place in a number of expedition stages with the ultimate aim of drilling through the interplate boundary between the Philippine Sea and Eurasian plates at the Nankai Trough – the source of historic and predicted catastrophic earthquakes. I joined the expedition in its penultimate stage in January this year.

[\[Chikyu sequence – Moon pool, Drilling deck, drill bit, Derrick tower, engines, laboratories etc\]](#) Photographing aboard the CHIKYU drilling vessel was a short and intense experience that allowed me access to facilities that are at the very frontier of scientific enquiry and exploration in this field. In terms of human ingenuity and endeavour, CHIKYU can easily be compared to other historic exploratory missions beyond the surface of the Earth. The central, spirited (and perhaps Romantic) purpose of the mission is to build detailed scientific knowledge and understanding

of deep-earth processes for the benefit of mankind. CHIKYU symbolises human efforts to gain knowledge and understanding of forces beyond our comprehension and to employ technology to intervene, interact or counteract those forces – if not to conquer Nature, to know, to understand and to predict its power.

[Kochi Repository sequence] As an indication of these endeavours, my photographs aim to describe the technological constructs that are being applied to these ambitions. The sequence describes the engineering structure of the ship itself, as well as the scientific facilities that accompany it. The core samples that are extracted by CHIKYU from the inter-plate boundaries are initially analysed, dissected, tested and scrutinised by scientists in laboratories on the ship. The cores are then stored in a refrigerated repository at the Kochi Core Institute, which keeps 150kms of samples that are equivalent to 200 million years of geological time.

[Tohoku samples] During my visit to the Kochi Repository, I was able to make photographs of core samples that were extracted from 7000m beneath sea level during the 2012 Japan Trench Fast Drilling expedition. These samples were taken from the fault that caused the 2011 Great East Japan Earthquake and tsunami.

Miho (and my return to Iwate)

[Suruga map] Shortly after completing the CHIKYU photographs, I travelled to one of the other towns on the South coast of Japan, west of Tokyo, where the 1700 Cascadia tsunami had been recorded, but which had not been affected by the 2011 tsunami. Miho is a small peninsula of land between Shizuoka and Fuji City in the Suruga Bay. The Suruga Trough (the so-called 'Tokai Gap') is just a few kilometres off the coast and is the likely location of a major earthquake and possible tsunami in the near future. The fate of Miho, which lies partly on land reclaimed from the sea, barely more than 1m above sea level, is precarious.

[Miho sequence]

The photographs in this series, together with the small number of photographs I made when I returned to Otsuchi and Kuwagasaki in January 2014, form a quiet coda to the 2011 series. **[Kuwagasaki]** **[Otsuchi]** Three years after the disaster, my personal connection and involvement in the processes of recovery, planning and rebuilding (socially and architecturally) is inevitably much more peripheral and separate once again. I am no longer caught up in the history of these events in such an immediate way and I no longer feel any sense of authority or justification in commenting upon the progress that is being made (or lack of progress) in these places. Perhaps this will change as time passes, but my instinct is that my perspective on these gradual and local changes is not useful and that a respectful distance and silence is of greater value.