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Shores: Sharks, Nets and More-Than-Human Territory in Eastern Australia

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Abstract
In Australia, for eight months of each year Sydney’s most popular beaches are laced with fishing nets. Stretching 150 metres (492 feet) across, and set within 500 metres (1,640 feet) of the shore, the nets are anchored off fifty-one beaches between Newcastle in the north and Wollongong in the south. The aim of the Shark Meshing (Bather Protection) Program NSW is to reduce the risk of dangerous encounters between sharks and people, and specifically to deter sharks from establishing territories (Department of Primary Industries NSW 2009, 2015). Program managers achieve such ends by devising and deploying tools and employing people to catch and kill sharks. By considering what happens when non-human animals are enlisted in territorialising practices of shore control, this chapter examines and unsettles the interplay between multiple interpretations of territory and the political implications of those interpretations. The work traces the state of New South Wales' Shark Meshing (Bather Protection) Program to understand how territory is claimed, asserted, and confounded at the shore. Grasping the ways in which territory is made and remade at the shore is important conceptually, politically, and practically, as it sheds light on our understanding of territory. More specifically then, this work is also important because these practices have direct implications for the safety and well-being of people, and for the conservation of marine animals, species, and environments. Especially significant in this case is the question of how the Shark Meshing Program plays out for several species of shark that are at once formally recognised as threatened and as potentially threatening to humans. The shore is our point of departure: the line where the land meets the sea. The broader transitional zone - the coast - includes areas above and below the water line, a zone where terrestrial environments and processes influence marine ones, and vice versa (Woodroffe 2002). This liminal space is neither land nor sea; rather, it is a zone that merges two distinct geo- and biophysical domains. At the shore the land’s seeming solidity and stability meet the liquidity and constant motion of water: a marked shift in flux. The coast presents a continually changing land-/sea-scape, as tides advance and retreat, changing water depth and morphology. This place is also one where humans encounter a distinctly non-human world. Permanent human habitation is not possible, yet life thrives. These distinct qualities of the coast are fundamental to its contested use. By exploring territory beyond land, we also explore territory beyond the human. I argue that asserting, maintaining, and contesting territory are more-than-human projects. Non-human animals and materials play vital roles in co-producing territory. In this chapter a series of interrelated accounts of the Shark Meshing (Bather Protection) Program NSW illuminates the more-than-human project of producing territory beyond terra. In what follows, I examine four key agents that work outside or alongside governance institutions to make and remake territory at the coast, namely, the coast itself, sharks, bathing human bodies, and nets. But first, an account is needed of territory at the ocean's edge, and contemporary approaches to shark hazard management.

Keywords
shores; eastern, sharks, australia, nets, more-than-human, territory

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Sharks, nets and disputed territory in eastern Australia

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SHARKS, NETS AND MORE-THAN-HUMAN TERRITORY IN EASTERN AUSTRALIA

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In Australia, for eight months of each year Sydney’s most popular beaches are laced with fishing nets. Stretching 150m across, and set within 500m of the shore, the nets are anchored off 51 beaches between Newcastle in the north and Wollongong in the south. The aim of the Shark Meshing (Bather Protection) Program NSW is to reduce the risk of dangerous encounters between sharks and people. Specifically, the program seeks to ‘deter sharks from establishing territories’. It does so by devising and deploying tools and employing people to catch and kill sharks.

This chapter examines the interplay between multiple interpretations of ‘territory’ and their political implications by considering what happens when nonhuman animals are enlisted in territorialising practices of shore control. The work traces the state of New South Wales’ Shark Meshing (Bather Protection) Program to understand how territory is claimed, asserted and confounded at the shore. In this case, the idea of territory is disputed at the same time as the space over which territory is claimed.

Grasping the ways in which territory is made and remade at the shore is important conceptually, politically and practically, as it sheds light on our understanding of territory. More specifically, this work is also important because these practices have direct implications for the safety and wellbeing of people, and for the conservation of marine animals, species and environments. Especially significant in this case is how the Shark Meshing Program plays out for several species of shark that are at once formally recognised as threatened and as potentially threatening to humans.

The shore is our point of departure: the line where the land meets the sea. The broader transitional zone—the coast—including areas above and below the water line. A zone where terrestrial environments and processes influence marine ones, and vice versa (Woodroffe 2002). This is a liminal space that is neither land nor sea; a zone that merges two distinct geo- and biophysical domains. At the shore the seeming solidity and stability of land meets the liquidity and constant motion of water; a marked shift in flux. The coast presents a continually changing land-/sea- scape, as tides advance and retreat, changing water depth and
morphology. This is also a place where humans encounter a distinctly nonhuman world. Permanent human habitation is not possible, yet life thrives. These distinct qualities of the coast are fundamental to its contested use.

By exploring territory beyond land, we also explore territory beyond the human. I argue that asserting, maintaining and contesting territory are more-than-human projects. Nonhuman animals and materials play vital roles in co-producing territory. In this chapter a series of interrelated accounts of the Shark Meshing (Bather Protection) Program NSW illuminates the more-than-human project of producing territory beyond terra. I examine four key agents that work outside or alongside governance institutions to make and remake territory at the coast; namely, the coast itself, sharks, bathing human bodies and nets. But first, an account of territory at the ocean’s edge, and contemporary approaches to shark hazard management.

**Territory at the Ocean’s Edge**

The shore is where land-based two-dimensional notions of territory as area are augmented by verticality, volume, and the complexity of three-dimensional space (Elden 2010, 2013a). But the ocean’s edge marks more than a third dimension; more than volume as metric (Lehman 2013a). Rather, this space is defined by specific material properties, tendencies and capacities (Dittmer 2014; see also Lehman 2013b; Steinberg and Peters 2015). Through these the ocean and coast (and scholars working in these places) challenge the ‘grounded’ world of Earth’s solid surface (Steinberg and Peters 2015), which has so strongly informed political thought and action. In this context, land-based techniques for measuring and controlling space are confounded. The ‘political technology’ of territory—the series of techniques, arts and practices of government (Elden 2010)—must take an altogether different form.

*Geopolitics* is significant in our pursuit of understanding territory beyond *terra*—beyond and in addition to the limits of land. Here, geo-politics refers not to politics at the global or international scale, but to the materiality of the Earth—its soils, atmosphere, water and so on (Elden 2013b). ‘In a world negotiating geopolitical challenges linked to disease … disaster … climate change … and shifts in the broader biosphere’, Dittmer (2014: 396) urges that ‘increasingly attention to the biological/environmental/material is a pre-requisite for engagement on issues of the day’. If we wish to consider politics with reference to the Earth, that endeavour must include thinking through the planet’s oceans. Steinberg and Peters (2015: 260) argue that ‘attentiveness to the sea as a space of politics can upend received understandings of political possibilities and limitations’. Attentiveness to the materiality of
the ocean ‘produces a radically different interpretation of space, and an alternate understanding of who holds power and how they project and reject it’.

Among the materials of the ocean is its animals. Dittmer advocates tracing how animals and other materials influence relations in contingent ways. A posthuman turn in geopolitics, he insists, incorporates animals, nature and other objects into our understandings of geopolitics. Engaging with the posthuman becomes an ethical imperative, and lays out a ‘line of flight’—a research agenda—for ‘making a break with the exclusive hold of humanity on political agency’ (Dittmer 2014: 397). Of course, geopolitics is more than material. Attending to animals shines light also on qualities and behaviours, on individuals and groups, on single species and ecosystems, on bodies and affects, on discourses, on how things come together and come apart over and again and with what effects. To understand the material foundations of political power we must pay close attention to the specific materiality of places and the specific ways in which things interact over time. The conditions of the coast present an opening to reach beyond terra and beyond the human as we attempt to understand territory.

In the context of shark hazard management and shore control, territory is made—claimed, asserted and confounded—via continual engagements between humans, animals and other materials and processes. The Shark Meshing (Bather Protection) Program NSW is a political institution made by, and with implications for, more than humans. Central to the program is its location on the coast; the place where land meets sea, and where humans most frequently encounter the ocean and all that dwells there. The program exists at this distinct contact point between humans and the nonhuman world. It enlists nonhuman animals in the making of territory. By exploring the distinct relations at this site, I seek to contribute to our growing knowledge of how human lives, institutions and politics are enabled, shaped and limited by nonhuman life, including animals (Buller 2014), plants (Head et al. 2015), fungi (Tsing 2015) and others. Within this field of multi-species interactions, animals of the sea have been poorly represented, and animals other than mammals especially so (Bear 2013). Thus, I pay particular attention to the ways in which sharks have agency in geopolitics and the making of territory.

**Managing Shark Hazard and the Shark Meshing (Bather Protection) Program NSW**

The risk of dangerous shark encounter is extremely low. On average 1.1 people per year are killed by sharks in Australia, and another 5.9 injured (measured over the two decades 1990—2010) (West 2011). This rate of incidence compares to at least 87 coastal drownings on
average per year (Brighton et al. 2013; West 2011). These low numbers are no comfort to the people affected, but are significant when thinking through shark hazard management. Despite their rarity, shark accidents attract a great deal of media and political attention (Neff 2012), due to both their high drama and the tremendous fear sharks provoke in many people. Individual incidents are high-profile, and clusters of incidents even more so. Take, for example, the labelling of Western Australia as ‘Shark attack capital of the world’ (Tedmanson 2012), following a spike in shark-related fatalities in the state during the period 2011–12, and triggering a highly controversial debate. Key moments in the debate included: a ‘trial’ shark cull allowing pre-emptive killing of sharks ‘identified in close proximity to beachgoers’ (Department of Fisheries 2012); multiple public protests attracting 6,000 people at Perth’s Cottesloe Beach, and thousands more around Australia and other parts of the world; a record 12,000 submissions to the state Environmental Protection Authority against continuation of the cull; and the State government’s eventual abandonment of the policy (Gibbs and Warren 2014).

Various strategies to reduce the risk of dangerous shark encounter exist around the world; among them, killing is popular. Killing and culling strategies have been adopted in Australia, South Africa, the USA, the French region of Réunion Island, New Zealand, Egypt, Russia, the Seychelles and Mexico (Gibbs and Warren 2015). On the east coast of Australia, nets are used in New South Wales and Queensland. In addition, since the 1960s Queensland has deployed baited drumlines: large baited hooks tethered to a line and floating drum. The New South Wales netting program has a particular take on hazard reduction. One of its aims is to deter sharks from ‘establishing territories’ (Department of Primary Industries 2009; Green et al. 2009: 4); the method for achieving this aim is to reduce the number of sharks by entangling and killing them in nets.

The Shark Meshing (Bather Protection) Program NSW was introduced in 1937 as a method of governing ocean spaces adjacent to popular swimming beaches. It was established in response to a number of ‘shark accidents’—in the language of the day (Neff 2012)—some of which were fatal. Reid and colleagues (2011: 676) explain that ‘use of anchored, large mesh gillnets as a preventative measure was pioneered in NSW’, following a recommendation by the NSW Shark Menace Committee of 1929 that they may afford a ‘cheap and effective way of minimising the shark peril’.
The program began with nets strung out year-round at 18 of Sydney’s most popular beaches. It was gradually expanded, and in 1949 beaches along the Newcastle and Wollongong coasts were added. Today, 51 beaches on the New South Wales coastline are netted for eight months each year (Green et al. 2009). The Shark Meshing Program employs 150m-long gillnets suspended off shore. Importantly, the nets do not create a barrier between swimmers and the open ocean. There is no “inside” or “outside” a netted zone keeping people and sharks apart. Rather, the nets are anchored approximately 500m off shore, with the aim of catching sharks. In this way, the nets do not form territory by creating bounded space. Rather, they function through social power. The Shark Meshing Program produces territory by creating a sense of human control and authority over the entire coastline, and enacting violence against nonhuman animals.

As noted, lethal methods for managing risks associated with human-shark encounter are common around the world. But in recent years, and particularly following the controversy in Western Australia, kill-based strategies have come under strong criticism (Gibbs and Warren 2014, 2015). In the eight decades since the introduction of the Shark Meshing Program much has changed. Attitudes towards the environment and marine life, including sharks, have shifted dramatically. So too has our knowledge of the ocean. Further, the material conditions of oceans have altered significantly, with reports that marine environments and species have been decimated by over-fishing. Sharks and rays in particular have suffered as a result of human-induced pressures (Dulvy et al. 2014; Worm et al. 2013). A recent study of sharks and their relatives—rays and chimaeras (chondrichthyan fishes with cartilaginous skeletons)—found that of 1,041 species worldwide, more than half face elevated risk of extinction. Based on analysis of the IUCN’s Red List of Threatened Species, at least one quarter of species are threatened and well over one quarter are categorised as Near Threatened. The largest sharks and rays are in greatest peril (Dulvy et al. 2014). Among those listed are the great white shark (Carcharodon carcharius), tiger shark (Galeocerdo cuvier), and bull shark (Carcharhinus leucas). These three species are also identified in Australia as the key species that pose a potential threat to humans (Department of the Environment n.d.), and therefore provide the focus for shark hazard mitigation strategies.

The Shark Meshing Program has, since December 2003, been listed in New South Wales as a ‘Key Threatening Process’, because the program ‘adversely affects two or more threatened species’; specifically, the vulnerable great white shark and the critically endangered east coast population of grey nurse shark (Carcharias taurus). Further, the Scientific Committee
established by the Threatened Species Conservation Act found that ‘Implementation of shark control programs on ocean beaches results in the bycatch of a wide variety of non-target marine species’, including six other threatened species of marine mammals and reptiles (Office of Environment and Heritage 2011).

Old and outdated political technology, the Shark Meshing Program currently faces a new, distinct challenge: to protect beachgoers while upholding legal responsibilities and public expectations to conserve marine life, including species recognised by national and international institutions as being under threat. This marks a shift from the original remit of the program, devised at a time when knowledge of marine environments was comparatively limited, when marine species did not face the extent of peril they do today, and when public sentiments about the environment in general—and the possible impacts of human activities in particular—were entirely different.

From 2009, the Shark Meshing Program was to undergo review every five years. In 2014–15 the nets were in the news. Organised opposition by marine institutions and non-government organisations demanded that the nets be removed or, at the least, their time in the water be reduced. Opposition is based on two main arguments: that damage to marine life and environments is significant; and that the program’s effectiveness in improving human safety remains unproven. Meanwhile, at un-netted beaches on the state’s north coast, a vocal minority called for nets to be introduced at local beaches following several shark sightings and bites, including one fatality. For over a year the New South Wales government refused to reduce or extend the reach of shark nets, instead affirming its commitment to trialling non-lethal methods to keep beaches safe. In the face of increased public pressure, the government finally approved nets in the north. Despite the potential of alternate non-lethal strategies, and political will to adopt them, the established political technology for maintaining coastal territory persists.

**Making Territory through the Shark Meshing Program**

The idea of territory is fundamental to the Shark Meshing Program: one of its explicit aims is to prevent sharks from establishing territories. In this way the program contests the territory of the coast. But within the program the concept of territory is also contested. It asserts that sharks establish territories; marine biologists dispute this claim. Through their recreational and professional activities humans use the water, seeking to claim a territory of sorts; yet some people argue that in entering the water we are entering sharks’ territory. The New
South Wales government claims the coast as human territory and defends it through the most aggressive means possible—killing. In doing so it must negotiate federal and international laws and agreements for protecting marine environments and threatened species, which presents a new challenge in maintaining territory. Inherent in these conflicting ideas and actions is an assumption that humans and sharks cannot use the same area of water; cannot coexist¹. Yet this assumption is not supported by evidence (see Chapron et al. 2014, Gibbs and Warren 2015).

The specific ways in which these interpretations of territory and territorialising practices play out are determined by the distinct material properties, tendencies and capacities of the coast. In order to better understand how territory is made and remade at the coast, and how nonhuman animals and materials are enlisted in these processes, the remainder of this chapter examines the materiality of four key agents in the Shark Meshing Program. Specifically, the following sections analyse the roles of the coast, sharks, bathing human bodies and nets in making and remaking territory.

**Coast: Forming Territory**

The coast forms the diverse and fluctuating biophysical conditions for territory. Attending to the geopolitics of territory (in the sense discussed above) demands paying close attention to the materiality of the Earth. This required looking to other fields and specialisms; notably in this case coastal geomorphology, marine biology and ecology. The New South Wales coast, within the area of the Shark Meshing Program, is characterised by a morphology of rocky headlands and sandy embayments. Geological, oceanic and climate processes come together to form the coast—the transition zone between land and sea (Woodroffe 2002). The coast is both a setting for, and an agent in, the formation of territory. Coastal assemblages of sandy bays, rocky headlands and estuaries allow and limit human activity, shark behaviour and ecology, and shark hazard mitigation strategies. People, sharks and hazard mitigation technologies interact in different ways with the material qualities of the coast. The materiality of the Earth affords different opportunities for individual actors and institutions to make or contest territory.

For people, the position of headlands and estuaries, form and profile of beaches, current and wave action, and weather patterns, interact to determine swell, surf and rip current, forming the conditions for swimming and surfing. Rock platforms, waves and tides come together to make promontories for fishing and places to explore life in rock pools. Beneath the waterline,
rocks, reefs and seabed combine to create habitat for the plant and animal life sought by divers and snorkelers.

For sharks, the coast forms diverse habitat and opportunities for territory. Inshore rocky reefs, islands and caves, and sandy seabed form habitat for the critically endangered grey nurse shark (Department of the Environment 2016), loved by divers and harmless to people. The three key potentially dangerous shark species—white, tiger and bull sharks—also inhabit this coast. White sharks are highly mobile, preferring cool waters (18–20°C/64–69°F). Juveniles display two main behaviour modes: travelling and temporary residency. One of three temporary residency sites on the east coast—Stockton Beach—is on the edge of the netted region, just north of Newcastle. Although adults of this species are without question the most widely feared of sharks, juveniles present little risk, surviving on a diet of teleosts (finfish) and elasmobranchs (sharks and rays). Temporary residency at Stockton is determined, in part, by abundance of such prey (Bruce and Bradford 2012). In contrast, tiger sharks prefer warm waters. They are widespread and globally distributed in tropical and warm temperate seas, and are most abundant in eastern Australia December—April when water is at its warmest. They subsist on an exceptionally diverse diet, including carrion (Randall 1992).

Bull sharks thrive in estuaries and coastal rivers. They have been recorded in all parts of Sydney Harbour, but only in summer and autumn when water temperatures were above 23°C/73°F (Smoothey et al. 2016). Salinity though is the more important indicator of their presence. They have been observed in salt, brackish and freshwater, but prefer moderate salinity levels of 7–20 grams per kilogram (where freshwater is 0–0.5g/kg and average seawater is 35g/kg). Scientists do not fully understand them, but it seems they move in response to changing salinity to conserve energy or due to physiological limitations (Heupel and Simpfendorfer 2008).

The design of shark hazard mitigation strategies is also shaped by the morphology of the coast. Beginning in the final decades of the nineteenth century a series of tidal ocean baths was hewn from the rock platforms around Newcastle, Sydney and Wollongong. The pools provide swimming places protected from the breaking waves, rips, and variable and sometimes unexpectedly deep water of this stretch of coast. They also serve to keep people and sharks apart; an early effort to create shark and human territory through firm physical demarcation. Today the rock pools are popular with lap swimmers and recreational paddlers, including small children and people under-confident, or unfamiliar, with the sensation of being in the water at a surf beach. At harbour and estuary beaches, much calmer waters
afford a different type of swimming area: stretches of beach or coves fully enclosed by nets or steel bars, the explicit purpose of which is to keep people and sharks apart. In contrast, ocean and especially surf beaches are less suited to such structures. Strong currents, rough surf and steeply sloping and variable seabed conditions have, to date, prevented construction of swimming enclosures. Now, as in the 1930s, the solution to the problem of people encountering sharks on this stretch of coast is gillnets, which aim to reduce shark accidents by reducing shark numbers.

**Sharks: ‘Establishing Territories’**

At the centre of the *Shark Meshing Program* are two core assumptions: that sharks establish territories; and that this behaviour has negative consequences for people. The media embellish these assumptions, suggesting that sharks aggressively defend territory. Yet the logic is flawed. Scientists describe sharks as displaying diverse movement behaviours, including long distance seasonal migration, moving over a home range, and periods of temporary residency and travelling (Block et al. 2010; Bruce et al. 2006; Simpfendorfer and Heupel 2012). In the field of ecology, ‘territory’ has specific meaning, signalling an area that an animal consistently defends, usually against members of its own species. There is no evidence that sharks—specifically the “dangerous sharks” targeted by the *Shark Meshing Program*—display such behaviour. Scientists and members of the public object to the misuse of the term territory and its use as a rationale for the program. The range of interpretations of the term territory has led to misinformation, confusion and poor outcomes from policy- and decision-making. Paying close attention to shark behaviour, rather than to an imagined idea of sharks ‘establishing territories’ is crucial for informing publics and policy. As such, it is worthwhile considering the specific materiality of sharks and the coast amidst these debates.

Sharks are surprisingly poorly understood. They are extremely diverse in their biology, ecology and behaviour. On the east coast of Australia, for example, white sharks—most feared, and listed as both threatening and threatened—are highly mobile (Bruce et al. 2006). Populations move the full length of the east coast and southwest to South Australia. Movement is seasonal and highly regular, with animals travelling north during autumn-winter and south in spring and early summer. Individual animals use remarkably similar paths, suggesting reliance on similar cues or a common ability to navigate between destinations. They spend most of their time on the coastal shelf in waters up to 100m deep, but at times enter open ocean and cross deep gulfs, including the Tasman Sea. ‘Use of environmental cues
such as detection of bottom depth, olfactory cues, geomagnetic orientation and orientation to the sun’ are likely methods of navigation (Bruce et al. 2006: 171). They may also reside temporarily when food sources are available, moving away quickly when prey disperses. Finfish are especially important, and as white sharks mature—reaching 3m and more in length—they begin to feed on marine mammals. They also show great ‘plasticity’ in their swimming behaviour, including ‘prolonged periods at the surface and at depth, oscillatory or “yo-yo” ascents and descents, regular intervals at the surface and at depth, diel periodicity, deep dives at dawn or dusk and periods of highly erratic swimming depth’ (Bruce et al. 2006: 170). White sharks, like other species, demonstrate tremendous diversity in their use of ocean spaces; diversity that is not captured by the phrase ‘establishing territories’.

The governmental review of the Shark Meshing Program during 2014–15 involved public debate about the premise that sharks establish territories. Here, the concept of territory became a factor in public discourse and policy-making. Sharks and the coast came together in policy and public imagination in ways that differ from actual material relations. The complex and nuanced forms of habitation and mobility, and the diverse behaviours displayed by different species and by animals of different ages described above, is not captured by the overly simplistic, generalised and inaccurate phrase ‘establishing territories’. Yet it was the imaginary that shaped policy. Paying greater attention to materiality—in this case shark biology and ecology—can contribute to an alternate geopolitics of the coast by better informing publics and policy-makers of the processes, properties, tendencies and capacities of the Earth. This may contribute to more effective political technologies and better outcomes for multiple species².

Bathing Bodies: Claiming Territory

Australia has a strong beach culture. Seasons affect who visits and for what purposes, but year-round people are drawn to the beaches and rocky headlands of the coast. Ocean, climate and landscape processes form the swell, surf, rip currents, temperature, weediness, clarity or cloudiness of water that make the coast. Processes operating across time scales—hourly, daily, seasonal and longer—constitute the conditions that draw people in, or turn them away to wait another day. But bathing bodies of one kind or another are an everyday feature of the coast, and bodies play a role in claiming territory.

When we enter the water, we seek to establish a place there; to claim a territory of sorts (Anderson 2013; Waitt and Warren 2008). As individuals and as a society we seek power and
authority over the coast through our material interactions; we claim territory with our bodies, boards, wetsuits, fins, masks, breathing apparatus, lifeguards, observation towers, jet-skis, beach buggies and boats. We make use of all these materials, and more. But here I want to focus on the human body, which has distinct agency in our efforts to establish territory, and in the specific ways that those efforts are enabled and confounded.

People seek different things when we enter the water: water cools the body and blood; movement in water and waves invigorates and refreshes; surfing and body boarding provide a surge of endorphins or adrenaline; snorkelling and diving allow us to see and explore beneath the surface, to observe and interact with some of the living beings that dwell there. People’s ability and agility in the water varies tremendously, but some things are common. Most obviously, we need air to breathe, which limits our abilities beneath the surface (breath-hold and SCUBA diving notwithstanding). In the water we are not ‘in our element’, biophysically or figuratively. Irrespective of one’s passion for the water, the fact remains that the human body is not biophysically adapted to be on or beneath the water surface for extended periods, and few of us are at our strongest and most alert there. This confounds our efforts to establish territory, and shapes the political technologies we devise to do so.

Further to our need to breathe air are the material qualities of human sensory perception; in particular, sight. Sharks and other fish and marine animals have senses adapted to the material qualities of sea water, including highly sensitive electro-, magnetic- and chemo-reception. In contrast, as a species we humans rely heavily on our sense of sight to make our way around the world. On land we seek cues and devise our urban and other living spaces with strong reference to the visual (a fact not lost on people with visual impairment). This key sense is limited in the water. Human eyes are adapted to sight in air. The refractive index of water challenges our ability to focus. Under water we miss much of the world around us. And the limits to our senses remain even with the aid of specially designed underwater technologies. A humble pair of goggles dramatically improves our ability to see, but visibility—including distance and colour perception—remains reduced and distorted.

This fact of reduced visibility is relevant in the making of territory through the *Shark Meshing Program* in two key ways. Reduced visibility in the water means that we become more vulnerable to potential threats, for the simple reason that we may not see them and have no other reliable means for sensing them. As a society we seek to limit those threats through our political technologies, as the *Shark Meshing Program* attests. Nets overcome our inability
to see beneath the water surface by working independently of our sense of sight. In this way, the political technology we develop to claim territory at the shore seeks to overcome our bodies’ (in)capacities. But in doing so, our efforts to claim territory are largely out of sight. The territory being claimed is not simply an area of water, but a third dimension beneath the water’s surface. Viewed from the land, this realm is largely out of sight. The strategy we devise to claim territory, and its ecological consequences, are likewise out of sight. Through the *Shark Meshing Program* we have devised a political technology that limits access to information and capacity for public critique.

**Nets: Asserting Territory**

The New South Wales government asserts power and control over the shore by sanctioning the killing of sharks, exemplifying ‘the creation of space through violence, over which violence is then exercised’ (Elden 2010: 808). Assertion of territory through the *Shark Meshing Program* sees sharks and other animals rendered killable.

The program—including the materiality of nets and practices of deployment—is highly regulated. The gillnets used in the program work by trapping and entangling animals. Trapped animals are found when a net is hauled, according to regulation, after being set for no less than 12 hours and no more than 96. ‘All reasonable effort’ is made to release entrapped marine life (Green *et al.* 2009: 88). However, many animals are killed in the nets. Depending on species status and other factors, carcasses are dumped outside three miles of the coastline or delivered to the New South Wales Department of Primary Industries (Green *et al.* 2009). Netting twine, mesh size, hanging coefficient, floatline, leadline and floats are all specified by the work contract. Method of meshing, vessels and gear, maintenance of equipment, safety of employees, records and reporting, disposal of catch, requirements for trapped marine life, and media communications, are also regulated (Green *et al.* 2009). Nets are 150m long, 6m deep. They are set within 500m of shore, and are ‘bottom set’ in water not deeper than 12m (Green *et al.* 2009). At some beaches, nets may be ‘double set’, meaning two nets are strung together to provide a total length of 300m. Most beaches are significantly longer, meaning that animals and other materials can move to either side and usually above the nets. Mesh size is 50–60cm, ‘measured in accordance with the manner prescribed in Clause 115 of the (General) Regulation 1995 made under the Fisheries Management Act 1994’ (Green *et al.* 2009: 86).
Regulation of the program forces close attention to materials and practices; these aspects of operation are carefully controlled. Yet the technology is blunt. The program attends to its primary aim to ‘reduce the risk of shark attack’ (Green et al. 2009: 4), but in so doing it has significant consequences for marine life and environments. The nets fail to discriminate. Although their design targets large dangerous sharks and efforts are made to safely release entangled animals, nets regularly catch and kill other fish and marine life. These consequences are not generally publicised. Between January 1950 and July 2008 at least 16,064 animals were caught in the nets. The catch included at least 23 species of sharks, 14 species of finfish, dolphins, turtles, whales, dugongs, seals and penguins (Green et al. 2009). The animals most commonly caught were species that pose no threat to humans.

To reduce unintended effects, the program is adapted from time to time. Changes have included fitting acoustic devises to nets to deter whales and dolphins, and setting nets on the seabed to reduce interactions with marine mammals, reptiles and birds (Green et al. 2009). The years 1983 and 1989 saw a two-step removal of nets during the winter months May to August (Green et al. 2009; Reid et al. 2011), the period that coincides with reduced numbers of people in the water, and with the bulk of the northerly whale migration. However, efforts to reduce negative consequences have limited effect. In November 2015 a humpback whale calf was entangled in nets off Soldier’s Beach on the Central Coast, during the annual southerly migration to Antarctic waters. In this case the animal was eventually released through the combined efforts of several public and private institutions over a five-hour period, to great media attention (Cardozo 2015). Few animals trapped in the nets are as fortunate as this highly charismatic one.

Nets form a material and political technology for managing shark hazard and asserting territory at the shore. They are heavily regulated in their material form and deployment. But despite regulation their negative consequences for nonhuman life are significant. The Shark Meshing Program manifests a particular politics. It violently asserts territory, and in so doing renders animals killable. This is a politics that over-rides legal obligations to care for threatened species, and finds death of individual animals—irrespective of the risk they pose to human safety—an acceptable project outcome. Here, the more-than-human context of the shore highlights the more-than-human consequences of territorialising practices. These consequences demand that we pay greater attention to the full range of effects of our political technologies.
Nets and Knowledge: Maintaining Shore Control

To maintain shore control, the *Shark Meshing Program* relies on shark nets and on ignorance and misinformation about the technology. Misinformation about nets takes three main forms. First, the nets are out of sight; public awareness of their existence is limited. Second, what and where the nets are is frequently misunderstood or misrepresented: the nets are not a barrier, but fishing equipment; they are not strung across a bay or beach, but anchored offshore. In this way, they assert territory not by creating a physical barrier, but by control through violence. Third, precisely how the nets work is rarely described or discussed.

Misinformation about the materiality of the nets works in concert with confusion about the nature of the territory under dispute. The *Shark Meshing Program* has been based on the idea that sharks establish and defend territories, but scientific knowledge does not support this assumption. Rather, research shows that sharks are highly mobile, usually following prey and inhabiting extensive areas of the sea (Block *et al.* 2010; Bruce *et al.* 2006). The program has also been based on an assumption that sharks and people cannot coexist in this disputed territory. When a shark sighting or accident occurs, heated debate ensues in the media and social media about whose territory this is, who has the right to be there, and who is responsible for maintaining that right. These questions become points of passionate contention. But the suggestion that sharks and people cannot coexist is contrary to evidence. Research in Western Australia found that people using the ocean reported encountering sharks frequently, without ill effects to people or sharks (Gibbs and Warren 2015).

Misinformation is evidenced in and exacerbated by the media. At least one tabloid newspaper has reported on the shark net at Sydney’s Bondi Beach (Daily Telegraph 2015). An aerial photograph published in the article showed a squiggly line stretching across the bay, almost reaching both headlands. It created two largely separate zones: one on the beach side for people, the other on the ocean side for sharks. This representation suggested that the nets establish territory by creating bounded space. Days later the image was republished, with the text ‘200m’ printed beneath the line representing the net. The headlands at Bondi are approximately 800m apart. A report from the Department of Primary Industry accurately describes the nets as 150m long, and illustrates the approximate location of the Bondi net, roughly mid-way between the heads (Green *et al.* 2009). The newspaper image from 2015 reinforced the incorrect view that the program creates safe ‘netted’ areas at the beach that exclude sharks. Confusion about the operation of the *Shark Meshing Program* is compounded
by existence of the ‘shark nets’, described earlier, that form fully enclosed swimming areas at some harbour and estuarine beaches (including Neilson Park, also known as ‘Shark Bay’). These two strategies for managing shark hazards represent two distinct modes of maintaining shore control: asserting territory through bounded space and through social power exerted by violence.

The image published in The Daily Telegraph misrepresented the extent of the Bondi Beach net in two dimensions, creating an illusion of two distinct realms: territory inside and outside the net. The two-dimensional image further reinforced the common misperception of separated zones by ignoring the third dimension of depth (see Elden 2013a; Steinberg and Peters 2015). Like the other nets of the Shark Meshing Program, the Bondi net is 6m deep and bottom set. The water here is approximately 12m deep (Green et al. 2009). The net can do no more than trap animals and other material moving through the lower part of the water column. The misrepresentation relates both to position and, more significantly, to function. Proliferation of misinformation—about the specific materiality of nets and sharks, and the nature of territory—plays an important part in the acceptance and continuation of the program, and therefore in the maintenance of shore control.

Geopolitics and More-than-human Territory at the Shore

This analysis of the Shark Meshing (Bather Protection) Program NSW has sought to examine what happens when nonhuman animals and materials are enlisted in territorialising processes. I argue that territory is made and contested by more-than-human agents. The chapter has illuminated four key agents, of different kinds; namely, the coast itself, sharks, bathing human bodies, and nets. Landscape, nonhuman animals, humans beyond their capacity to govern, and non-living materials all have agency in making and remaking territory. This analysis has implications for shark hazard management and human safety, and for our thinking about territory beyond terra.

Attention to the materiality of the coast has potential to inform strategies to improve the wellbeing of people and sharks in several ways. First, greater appreciation of the coast could be fostered to improve understanding of shark hazard; specifically, the influence of coastal morphology on shark habitat and migration. Existing knowledge held by marine and coastal scientists and ocean users could be better integrated into shark hazard mitigation strategies and public information. Second, knowledge of shark biology and ecology should play a greater role in informing hazard mitigation strategies and cultural practice, replacing
fantastical ideas about shark behaviour. Efforts are underway in institutions around the world to develop understanding of sharks. Greater effort is needed to incorporate this growing knowledge into policy and practice. Third, paying attention to the bathing human body may lead to more creative approaches for mitigating shark hazards for people, while also protecting other species. The existing strategy examined here—gillnets—overcomes our limited sense of sight beneath the water surface by working independently of it. But nets are indiscriminate. We might learn to draw on other senses to make better use of the specific materiality of water. Several emerging alternative technologies are doing just this, including sonar sensors, artificial kelp forests, and wet-suits that use visual design to play on underwater visibility and sharks’ sense of sight. Attention to the human body may spark further innovations. Finally, the nets of the Shark Meshing Program are destructive, yet they are out of sight: the result is that many people are not aware or not fully informed of their existence, their function and their effects. Public critique of this political technology is limited by its invisibility. At a time when environmental concern is high and widespread, information about destructive environmental practices should be more publicly accessible. A more informed citizenry would be better able to support or reject the existing approach, and meaningfully contribute to the process of determining alternatives.

The Shark Meshing (Bather Protection) Program NSW also informs our understandings of the concept and practices of territory. Analysis reveals that the program produces diverse interpretations of the term ‘territory’. The New South Wales government asserts that sharks establish territories. The media embellishes that assertion, describing sharks as aggressively defending territory when a shark sighting or human-shark encounter occurs. Scientists dispute the use of the term in this context, instead describing sharks’ extensive and diverse use of ocean space. People claim territory through bodily engagements with the beach, water and shore. The nuance of scientific knowledge comes head to head with popular understandings of the term territory, just as the space itself is contested. Shore control is claimed and confounded through interplay between meaning and materials: conflicting interpretations of territory; the specific materiality of the coast; and (mis)understandings of both.

The shore presents a special case for examining territory beyond terra. The shore is a liminal space; neither land nor sea, a zone in which distinct geophysical, biological and ecological realms meet. It is a constantly fluctuating environment, challenging thinking and practice of making territory. It is also a place where people meet a distinctly nonhuman world. This
prompts us to pay attention to nonhuman life and materials, and their roles in politics. Here we find that nonhuman lifeforms and materials—of very different kinds—are active in asserting, maintaining and contesting territory. Attending to the roles of nonhuman lives in the politics of territory obliges us to consider our legal and ethical obligations. Specifically, to notice that our persistent political technology of shore control renders animals—including threatened species—killable. In our encounters with them, animals elicit ethical obligations (Buller 2015; van Dooren 2014). Yet questions of ethics are often overlooked in decision-making and practice, as they are here.

More broadly, this case reveals something of our relationships with nonhuman animals and the nonhuman world. Making animals killable is a common outcome of human efforts to assert power over space. Such practices are premised on the idea of human exceptionalism. In addition, they assume that territory is disputed; that humans and other potentially threatening species cannot coexist. That assumption is contradicted by the evidence, which shows that they can and do (Chapron et al. 2014; Gibbs and Warren 2015). Popular discourses pertaining to territory in the Shark Meshing Program are consistent with those surrounding conflicts between humans and carnivorous species elsewhere (for example, Collard 2012). This debate is particularly significant in the context of global environmental change, which increasingly sees shifting ecosystems and species under threat. These challenges point to an urgent need to learn how to coexist with nonhuman others, including those that may pose a threat to us.

If we are to take seriously the agency of nonhuman lives and materials in shaping the world—to genuinely incorporate them into our thinking and practice—we must consider geopolitics. That is, a politics that pays attention to the material properties, capacities and tendencies of the Earth (Elden 2013b, Dittmer 2014). The geopolitics of the coast and shore control can be illuminated by attending to the specific materiality of the site. To do so effectively demands looking to and working with other disciplines and fields of expertise. In this way we might better appreciate how the making and remaking of territory beyond terra, and of our world, is a more-than-human project.
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In the field of ecology the ‘coexistence model’ is based upon the idea of ‘allowing people and predators together’, in contrast to the wilderness or ‘separation model’ of ‘keeping people and predators apart’ (Chapron et al. 2014: 1517). Within the humanities and social sciences the concept of coexistence is explored in contrast to present exploitation and extinction of nonhuman life (for example see Corbey and Lanjouw 2013).

One outcome of this debate was a shift by government away from emphasis on territory. In 2009 the state government’s public information ‘Primefact’ sheet explained that the nets ‘are designed to deter sharks from establishing territories, thereby reducing the odds of a shark encounter’ (Department of Primary Industries 2009). The 2015 sheet was altered to read that nets ‘are designed to reduce the chances of dangerous sharks aggregating near meshed beaches, thereby reducing the chances of a shark interaction’ (Department of Primary Industries 2015; emphasis added). This new language of aggregation raises new questions about the accuracy of representation of ecological processes. But the shift away from assertion of sharks establishing territories suggests that the public debate influenced policy.

The main species caught were hammerhead sharks, rays, whaler sharks and angel sharks (Green et al. 2009), predominantly species that pose no threat to humans. Bull sharks—listed as potentially threatening—belong to the whaler group (Carcharhinus spp.), but are one of at least seven species in the genus present in the catch. The Shark Meshing Program does not identify catch to species level in this group. Meanwhile, white and tiger sharks were caught in low numbers. This may be due to ‘low coastal abundance or limited catchability in the gear deployed’ (Reid et al. 2011: 690).