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### **The Ocean Exceeded: fish, flows and forces**

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#### **Abstract**

The ongoing conceptualisation of oceans and the hydrosphere by Peters and Steinberg is to be welcomed. They continue to challenge geography's historical tendency to focus on and from terrestrial spaces, exploring how oceans exceed their material, discursive and imagined boundaries along with their liquid form. This short commentary responds specifically to their assertion that 'The ocean is fish'. Using the example of Atlantic salmon, it questions the directionality at the heart of Peters and Steinberg's paper. It focuses particularly on the complex spatialities of salmonid life, and the ability of salmon to blur aquatic boundaries. The commentary argues that if oceans exceed, they are also exceeded, whether through the extra-planetary forces that guide salmonid migration and affect tides, or the inward flows of water from rivers. It ends by questioning the space given to non-human life in the more-than-wet ontology, asking how such actants might be implicated in oceanic excess, particularly when the ocean's intrinsic voluminous excess renders them beyond human awareness or understanding.

#### **Keywords**

More-than-human, Geographies of the sea, Fisheries, Atlantic salmon, Animal geographies

Moving beyond both the awkwardly neat elemental boundaries and landward perspectives that have often been geographers' focus, Peters and Steinberg's paper makes a welcome contribution to the ongoing conceptualisation of oceans and the hydrosphere. Valuably, they draw together multiple ways – discursive, imagined, material – through which oceans exceed their boundaries and 'material liquidity'. Through this, the authors continue to play a significant role in developing an alternative geographical vision, reconfiguring seas both as social spaces (Steinberg, 2001) and as voluminous (Steinberg and Peters, 2015) rather than simply as a surface to be crossed. They have maintained this trajectory – if self-critically – by exploring how future conceptualisations might not only work *from* the ocean, engaging with ways in which the ocean extends to other spaces. This reorientation is valuable, highlighting (but not limited to) the 'flows, connections, liquidities and becomings' that characterise the ocean; oceans, it might be said, are inherently relational, and these relations do not show respect for cartographic demarcation. However, I argue that their focus on oceanic emanations and oceans' ability to exceed liquidity and 'felt wetness' distract from the more complex and multidirectional flows and circulations in which oceans are bound up.

I take their assertion that 'The ocean...*is* fish' as my starting point. Their claim results from understanding oceans as 'an ensemble of parts that are more-than just liquid matter'; when any of those parts, such as fish, extend beyond the ocean, they carry the ocean with them in some form – such as onto dinner plates. Fish are, therefore, potentially central to the ocean in excess, and Peters and Steinberg also demonstrate that any failure of the ocean to travel discursively with fish is a cause for concern. However, viewing the oceans as 'a space of life' opens further questions around the directionality at the heart of Peters and Steinberg's paper. I use the example of Atlantic salmon to develop this argument.

As an anadromous species, Atlantic salmon emanate – literally and metaphorically – from the ocean; returning from one or more winters at sea, they battle their way to the upper reaches of rivers to lay their eggs. Embodying the ocean in excess, they exceed topographical ocean space, carrying the ocean on and within their bodies. To paraphrase Peters and Steinberg, Atlantic salmon *are* the ocean. Understandings of salmonid life have further been complicated by the voluminous materiality of the oceans. The North Atlantic Salmon Conservation Organisation (NASCO), for instance, referred to the 'mystery' of 'the factors influencing survival in the ocean' (Windsor et al., 2012: 3) – a mystery that results from 'the high cost of research on salmon at sea and the size of the North Atlantic' (p. 1). This might be understood as a different version of excess, returning to the earlier version of wet ontologies,

where the excessive volume of the oceans places them beyond human knowledge. The oceans exceed human perception and understanding, acting as a cloak for large parts of salmonid life.

Yet equally, while Atlantic salmon carry ocean beyond saltwater, they are *not* the ocean; they are spatial hybrids, belonging neither to ocean nor freshwater. Beginning life in the gravel beds of freshwater streams, they spend up to six years in rivers as parr before undergoing a process known as smoltification, involving ‘developmental changes in the biochemistry, physiology, morphology and behaviour of the juvenile salmon’ (Stefansson et al., 2008: 640). These can range from changes in colour to ‘a preference for moving downstream’ (ibid.) rather than fighting the current. Yet adult salmon only gain the ability and energy to produce and deposit their eggs through feeding at sea; leaving freshwater as smolts, they often migrate thousands of miles to ocean feeding grounds, before returning as adults to their natal rivers, once again making the transition between salt and fresh water. Their movement and physiological transformations blur aquatic boundaries as they flow through different forms of water. Equally, however, their requirement for metamorphosis reinforces these boundaries. Salmon act and embody flow, obstacle and transition.

Further, the migration of salmon, and salmonid spatialities more generally, can only be understood in relation to forces imperceptible to most humans. Central to their navigation at sea – and possibly at a smaller scale within rivers – is believed to be their engagement with the Earth’s magnetic field; an in-built GPS, as the media are wont to refer to it. Similarly, the ability of salmon to make the transition from salt to fresh water is in part driven (and complicated) by extra-planetary forces. As Jones (2011: 2287) argued, ‘the rhythms of the tides are folded into a range of eco-social systems,’ which include estuarine predation by seals and the temporalities of coastal net fisheries. If the ocean is excessive, it is also exceeded.

From this brief example, I conclude with three observations on Peters and Steinberg’s paper, reflecting on the implications for a more-than-wet ontology. First, their focus on oceanic emanations, while a welcome reorientation and provocation, offers a very partial perspective on something that is influenced intrinsically by inward flows of matter and forces. Their paper does acknowledge inward flows – for instance through oceanic detritus. They understand such detritus as an example of oceans exceeding their ‘characteristic liquidity’ as they ‘subsume’ matter. However, such ostensibly inward flows also connect oceans to other places in and beyond the hydrosphere. The example of salmon emphasises the complex, sometimes even chaotic, relations and spatialities at play here. The past hundred years of salmon management in the UK has in part been characterised by a spatial knowledge

politics, where blame for the species' demise has variously been directed at net fishermen, anglers, seals, cormorants, deep sea fisheries, changing ocean currents, climate change, pollution and aquaculture (Bear, 2004). The flows of salmon bring regulatory spaces into conversation (and perhaps conflict), and their management focuses not only on hatcheries and restocking in freshwater, nor only on their fate in the deep seas, but also on the flows and connections between salt and fresh water. A recent fisheries management plan for the River Dee in Aberdeenshire, Scotland, for instance, notes that the West Greenland salmon fishery now harvests around 1% of its peak catch but that its 'continued restraint...crucially depends on an equivalence being shown in the home countries of the salmon stocks, hence restraint is expected from both Scottish [mixed stock fisheries] and rod fisheries' (Dee District Salmon Fishery Board and River Dee Trust, 2015: 36). Those feeding grounds, far beyond the UK's territorial waters and jurisdiction, are nonetheless folded into Scottish river fisheries management – but equally, those Scottish rivers extend to Greenland through management discourse and the lives of salmon (cf Bear and Eden, 2008). Oceans, therefore, are emanatory but are also entangled. If the world is an extension, so are the oceans.

Second, and building on the previous point, I would question the primacy given to 'the ocean' by Peters and Steinberg. They talk of how 'the ocean, carried through the water cycle, can seep into the land through rainfall or snowfall'. While fundamentally accurate, this view reifies the *entity* of the ocean above all other forms of watery space; they might equally have spoken of evaporation from rivers and lakes, carrying that water to oceans through precipitation. If a starting point is to disrupt the tendency towards crude division between land and sea, referring simply to water (albeit in its multiple forms and materialities) would serve a similar purpose without relying on the spatial divisions that they, and other authors, are attempting to break down. For instance, the hydrosocial cycle, as developed by Linton and Budds (2014: 179), offers a political ecological framework in which 'the production of water as a socio-nature entails a complex process by which any change in the material form of water, in power relations, in framings of water, or in the uses to which water are directed has the potential to shift the whole constellation of socio-nature towards a different set of relations'. Framings such as this might usefully be augmented by a more-than-wet ontology, further drawing out water's multiple materialities, while building on the hydrosocial cycle's emphasis on flow and relation over spatial nomenclature.

Finally, although Peters and Steinberg refer to the ocean in excess as 'a space of life', I would argue that their account is oddly lifeless. Their reference to fish is as commodities or resources, killed and transported by humans. While this allows for an implicit account of topological folding, as humans

'[eat] the ocean' (Probyn, 2016), the wider implications of the ocean in excess for more-than-human life are little explored. I chose the example of Atlantic salmon in part to show how non-human life can be implicated in oceanic excess and the entanglement of different aquatic states and spaces. Those salmon are far from alone; they are joined, for example, by birds that feed between land, rivers, and sea, and by penguins relying on ocean-dwelling fish for their sustenance whilst dividing their time between water and ice. How, then, do different nonhumans extend the oceans? How do ruptures emerge in these extensions? How do they draw different spaces or material states into the oceans? More fully acknowledging the ability of nonhumans to create places (Philo and Wilbert, 2000) opens up an alternative reading of the ocean in excess, one influenced as much – if not more – by the actions and interactions of nonhumans as by humans (see also Bear, 2013). On one hand, this acknowledges the dominance – quantitatively at least – of oceans by nonhuman life; as spaces where fish and plants dominate ecologies. But it also further brings into question the role of the unknown, to the ways that parts of the oceans *struggle* to exceed their boundaries. Around 80% of oceans remain 'unmapped, unobserved, and unexplored' (US National Oceanic and Atmospheric Administration, 2018), while new forms of marine life, ranging from microbes to larger fish, continue to be discovered (e.g. Census of Marine Life, 2011). If the 'tether' between humans, the fish they eat and the oceans from which they emanate is becoming weak, what are the implications for oceanic excess, and the more-than-wet ontology more broadly, of the unknown of oceans – the life and space that are in turn hidden by oceans' voluminous materialities?

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