

(words 5888)

Kirsten Cooke, Goldsmiths, University of London

A Slice of Fluid Ground

'A Slice of Fluid Ground' aims to write-with water; a methodology that is resistant to its instrumentalization under Anthropocentric thinking and the Capitalocene. 'A Slice' recognises writing as providing a set of relations; a map for interacting with the world. It opens with a 'Key', which acts as a navigational tool for traversing the topography of the text. 'A Slice' attempts to construct a set of sited waters in a way that does not reduce the substance to a line (cartography) or a consistent quantity (hydrological cycle). 'A Slice' begins with the section 'Earthrise: The Ascent' and then descends into watery accounts and locations; a counter-operation to the notion that humans can transcend the landscape. 'A Slice' dives into the nuances and depths of water, situating humans as a species amongst multiple planetary actors. Writing-with water traverses personal and fictional narratives, hydrological theories, and fluid topographies.

Keywords: Writing-with water; descent; open sea topography; mapping; aqueous alliances.

Contributor bio:

Kirsten Cooke's research explores the way in which curating mediates and stages how we 'know', looking at exhibition environments to explore the space of infrastructure and queer ecologies. Recent exhibitions include *Metabolic Markets*, GIANT gallery (2021), and *Snow Crash*, IMT gallery (2019). Cooke has authored three curatorial research projects: *Material Conjectures*, *Concrete Plastic* and *House of Hysteria*. Recently published texts include, 'Transfictioning' in *Archives on Show* (Archive Books, 2022) and 'Let Me Tell You A Story' in *The Graveside Orations of Carl Einstein* (Ma Bibliothéque, 2019). Cooke is a lecturer at Goldsmiths (UoL) and holds a PhD in curatorial practice from the University of Reading (2016).

A Slice of Fluid Ground

Key

Writing informs the way we think and relate to the world. It provides us with a set of tools and logic systems that frame how we interact. These systems wire our thoughts and actions, as what we use uses us (Sara Ahmed 2019: 11). 'A Slice of Fluid Ground' assumes that there is no direct or pure relationship with the real. We construct and deploy technologies that enable us to collect data and these findings are accompanied by stories to provide us with access to what this information might mean. Similar to the act of charting, the author of 'A Slice' constructs a textual map that pictures a terrain of logics, subjective-logics, and counter-logics. The stories we tell matter, and it matters how we write, as each approach constructs a set of sensorial affects that integrate us in a system of relations. 'A Slice' is an experiment in writing-with water, as opposed to writing over the top of water, because the latter situates the author and reader outside the text. In contrast, 'A Slice' implicates the author, thinkers, writers, and readers in the topography of water through activating a range of literary modalities, such as personal narrative, theoretical stances, scientific ruminations, and fictional accounts.

'A Slice' aims to perform an analogous operation to that of the images you can find in secondary school geography books. These textbooks present students with a slice of rock that has clearly demarcated layers of sediment, which have been formed over timeframes beyond that of the human. The material segments of 'A Slice' are textual and formed from a range of lenses and approaches to mapping water. These layers are structured via a non-teleological, yet topographical

story, and are woven into the navigational subheadings of the text, which are labeled The Ascent, The Descent, and The Depths.

'A Slice' begins with current approaches to water, which are contaminated by Anthropocentric thinking (which assumes that humans are the superior planetary actors) and the Capitlocene, as identified by Donna Haraway (2016: 99) (an epoch in which we understand that the flows of capital are wiring the landscape of the planet). This first section is titled, 'Earthrise: The Ascent' because this way of thinking (through the Anthropocene and the Capitlocene) provides humans with the illusion that we can transcend planetary limits. The second section 'Folding: The Descent' suggests a plunging of the human into water, enabling us to write and be written into by a lively planet. The third and final section 'Aqueous Mapping: The Depths' proposes a writing method in which the notion of the individual and its accompanying human superiority will be lost but meaning and sensing is not. Mimicking our descent through the text, latitude and longitude coordinates give way to sections of the open sea; a slice of fluid ground often referred to as the Pelagic Zone.

Earthrise: The Ascent

**110km (68 miles, 60 nautical miles) above the surface of the Moon, orbiting the location on Earth at: 11°12'00.0"S
113°48'00.0"E**

It is Autumn 2008, we are in a flat I am renting off Newington Green, one which needs a lot of tender loving care and for that reason is still cheap (as well as cash-in-hand). I am lying on the pull-out sofa in the living room, staring up at the ceiling. It appears to bulge in places as if

its skin is filling up with water. I am struggling to write due to the liquid pressure mounting above, which encourages me to think horizontally as if tunnelling or navigating corridors.

Jarringly, I am pulled out of my liquid fervour encouraged by the atmosphere in my flat, and recall the comfort brought to humans through the first colour image of Earth. *Earthrise* (1968) was taken by Bill Anders, an astronaut on Apollo 8, who was circumnavigating the moon at the time it was taken. The photograph captured the surface of the moon before panning out and catching 'our' planet partially spot-lit by the sun and partly submerged in blackness. In viewing the Earth from space, we can fall into the trap of believing that there is a split between human and environment. From the astronaut's perspective, indexed in the photograph, we are situated above the planet and with this imagine ourselves as humans that are actively able to dominate the passive realm of the Earth.

Still submerged in the damp flat, I use my mobile to zoom into the gradients of the Earth that frame it in geological terms. A geological time, which existed before and will survive humans, has been useful in countering the anthropocentric ideology of the *Earthrise* image. However, Astrida Neiminas asserts that we have still been ignoring a central terraforming actor:

My invitation in thinking about Anthropocene water is thus, in the first place, a suggestion to pay more attention to the hydrosphere as the (again, oft-overlooked) fascia that lubricates and connects the Earth's lithosphere to its biosphere and atmosphere, those more popular players in this Anthropocene drama. Rising sea levels, melting ice caps, parched interiors, rogue storm surges and strange weather, rapid aquifer depletion and massive-scale water rechoreographies through irrigation,

dam-building, and riparian 'straightening' all remind us that our current epoch's radical terraforming is often explicitly the work of water – and that these are labours in which we humans are variously entangled. (Astrida Neimanis 2019: 160 – 161)

Neimanis situates the fantasy of global water management as consistent with the modern ideology of water as an H₂O molecule of variable but manageable mass that is transparent, tasteless, and scentless (2019: 157). For Neimanis, global water applies this modernist notion on a planetary scale in which the world's total hydrological cycle is abstracted and represented as stocks and shares (Neimanis 2019: 158). Global water is theorised as everywhere and nowhere in particular, which disembodies and displaces its nuances. This whitewashes water's spectrum of operations, site-responsive mattering, and its transgressive momentum. It manifests a culture of control, which positions humans as either masters of the earthly score, who can track and instrumentalise water, or as victims who can do nothing to prevent the impending doom of a watery apocalypse. As a result, global water cannot respond to the specific places and times that are presented by watery challenges.

51° 35' 53"N, 0°4'43"W

It's Spring 2023, and I'm looking out at the deluge beyond the window that, like a strip tease, veils and then reveals the rooftops that can be glimpsed from the bed in my Tottenham flat. I've just closed Julia Armfield's novel and can still feel its weight imprinted in my hands, which brings my eyes down to stare at its cover. A jacket with a salmon pink border, at its centre a female face distorted by water, appearing gelatinous as if taking on the fabric of the molecules that steam at the surface of a mirror or a window (or is it a glass shower

cubicle?) that acts as a fourth wall between the reader and the figure... Beneath this outer sleeve, the book's protagonist Leah, a submariner, undertakes a research mission to observe and record what they encounter in the depths of the ocean. Leah notes how their descent changes her relationship to the world:

In the sea there's no such thing as a natural horizon, no place for the line of sky to signify the end. When you sink, which we did, long hours of sinking – you can't see the top and the ocean around you extends on both sides with no obvious limit except the border around your own window. The earth and its certain curvature become less clear underwater. (Julia Armfield 2022: 45)

Breaking with the horizon line, Leah's anthropocentric perspective dissolves and she cannot define a split between human and environment. This split, caused by an ideological ascent in which humans transcend the Earth, can result in either climate change denial or (conversely) in environmental management and green stewardship. Corporate powers and scientists continue to pursue dreams of colonizing habitable planets in space, as possible sites for the mining of raw materials and in a desperate search for water as the necessary material of 'life' (back-up plans for when the earth is used up and burnt out). Simultaneously, green stewardship encourages the notion that humans are above the planet by inaugurating them with the power to shepherd the world's resources; as Jeffrey Jerome Cohen writes: 'Blending the romantic, the pastoral, and the georgic, green ecologies tend to dwell in the innate plenitude that nature offers, mourning its commodification and disruption' (Cohen 2013: xx). Romanticising a pure and undisturbed green or blue world that we can return to or that needs preserving, continues the fantasy of a bifurcation between a passive nature and an active human society. It

conjures a naïve and primordial realm, which needs to be saved by the very social actors that are threatening its ecosystems. For Leah, the ocean is alive, lively, and active, the mission itself ends up with water imprinting itself on her body. Upon Leah's return from the depths, her wife, Miri, is left questioning whether Leah ever did really return, as she spends seventy percent of her time in the bath, ingesting only salt water and soft-boiled eggs, and listening to recordings of the sounds of the deep ocean. Leah's research centre reassuringly describes this as a normal 'resurfacing glitch' (Armfield 2023: 95).

Folding: The Descent

At 35,000 feet above the Earth's surface at 47° 09' 33.91" N, 9° 33' 13.09" E

It's 2019, and I am on a flight back from Venice, after hiking around the Biennale and noting the irony that the winners of the Golden Lion were emphasising the effects of tourism on climate change, while innumerable plastic bottles mount up in the oppressive heat of the Arsenale. Separated from my fellow travellers due to flight cancellations, I am sat next to a nurse and her friend, who comment on the amount of water I am drinking (contributing to the flows of plastic). I nonchalantly reply that I drink too much water, if that is possible, and am unexpectedly met with the response that yes you can overdo water intake. Apparently, I am asking my heart to do too much work, adding pressure to its system, drowning it from within...

[...] 'biology,' or matter, is not an entity but is defined as a relational, dynamic process which is enfolded with the 'outside'. The use of the term 'fold' points towards the complex entanglement and interweaving of the inside with the outside to

the extent that it is impossible to make such distinctions or differentiations (Blackman 2008: 137-8).

Bodies are breaking into each other and eroding the distance between temporal planetary flows. Water envelopes these bodies, runs through them, and disseminates them across geological timeframes. As I ingest plastic molecules while quenching my thirst, the internal (plastic molecules in the liquid) and external hard-shell debris (the bottle) circulate the ancient oceans and emerging food chains. Daisy Hildyard implicates our human bodies in these unequal ecological flows, as opposed to denying their existence or picturing ourselves as green stewards that exist outside of them, through her conceptualisation of our 'second body' (Hildyard 2021: 25). A body that is attached and coextensive with our first body, our lived fleshy experience through which we all interpret the world. Picturing a second body enables Hildyard to trace the wider tentacles emerging from our first body, which thus become tangible, tapping in to and affecting the planetary ecosystems:

This idea of a body which can reach over to the other side of the world is not one that we tend to speak of in everyday language right now. In normal life, a human body is rarely understood to exist outside its own skin- it is supposed to be inviolable. The language of the human animal is that of a whole and single individual. You are encouraged to be yourself and to express yourself – to be whole, to be one. Move away from this personality, self-expression, and you risk going out of your mind, being beside yourself [...] Climate change creates a new language, in which you have to be all over the place; you are always all over the place. It makes every animal body implicated in the whole world. (Hildyard 2021: 13)

Through connecting our first body to a second one, Hildyard places humans inside the webs and chains of the biosphere. This also enables us to picture the toxic flows seeping and traversing human and non-

human bodies. Flows that include hazardous waste, which is often pictured to be outside the body and home, is already in the networks that exist between all actors but are unevenly distributed. Stacy Alaimo asserts that these toxins in transit reveal our interconnectedness with the environment and the impossibility to disconnect human beings from the planet. She writes:

Material memoirs arise from feminism's long history of attending to body politics and asserting that the personal is the political. Material memoirs do not, however, forge a solid identity politics of gender oppositions, but instead dramatise the miasma of uncertainties and interconnections in risk society. (Alaimo 2010: 95)

'Material memoirs' can produce counter-memories, which interweave a porous human body with the environment as opposed to the modernist ideal of a sealed human which is severed from the non-human landscape (Alaimo 2010: 85-112). Water is a material whose memoirs are transgressive, hosted and playing host to a variety of bodies. However, to enter water's counter-memory we must descend into its depths, and this requires an engagement that is distinct from the global management or instrumentalization of water.

**8408m below the surface of the Atlantic Ocean at 19°36'46.8"N
67°50'49.2"W**

This makes me think of Armfield's submariner, Leah, again. When technical issues turn the research mission of a few weeks into several months, she experiences water's material memoirs. When the vessel hits the ocean bed, Leah imagines that she is in the fifth layer of the ocean, which is the Hadalpelagic, or Hadal Zone. This is the deepest area of the ocean, where trenches and fissures are produced when tectonic plates converge. This zone also excites a mythology, much

like the underworld of the Greek god Hades from which it gets its name. It is imagined as a dark and inaccessible universe filled with monstrous creatures. When Leah questionably re-emerges from the subterranean realm, her body holds the score of the aqueous experience. She has been written into by the extreme (for human bodies) oceanic depths. Back in their flat, her wife Miri notes that Leah's nose bleeds at 6am every morning, and her gums and skin sporadically leak blood. One night is disrupted by screams, a soaked bed and ocean spray, as water is emitted from all areas of Leah's body leaving her mouth swollen with salt.

As my tongue grazes across the back of my bottom teeth, exploring the sediment that is building up and the terrain that these deposits are producing, two memories resurface that I am not sure are connected. My neighbour carrying a four or six pack of water bottles up the exterior stairs to their flat, which is opposite mine. He is at the base of the steps and kindly throws me a Twix, or was it Double Decker (?), and then comments on how unclean and unhealthy the water in the Tottenham taps is – nodding at the cumbersome bottles weighing his right arm down. I drink from the taps and descale the kettle regularly due to the hard water build-up which is released like sheets every time I swill it out before the next coffee, watching the shards slowly breakdown in the basin. These hard-water deposits brought me back to the plaque in my mouth and a recent study on dementia (which runs in my family) that linked the disease to plaque build-up in the brain and I wondered if this is the same matter as the plaque in my mouth...

Capitalism often places the burden of the environment onto the individual, by suggesting our susceptibility to illness is due to our own genetic make-up. However, it is the environment interacting with our genes that causes issues for specific bodies. As a result, we should be focussing on the environments that trigger certain genes or induce reactions in bodies. In describing the way in which trans-corporeality is posthuman due to its viscous-porosity, its membranes and its interactions, Alaimo refers to Vicky Kirby's account of writing: 'It is as if the very tissue of substance, the ground of Being, is this mutable intertext – a 'writing' that both circumscribes and exceeds the conventional divisions of nature and culture' (Alaimo 2010: 14). This praxis of writing-with, inscribing as we are inscribed, embeds humans in the environment as opposed to outside of it. An operation that is distinct from the modernist model that is built on mimesis and representation, in which the worlds of text and image are always separate from the real.

32°32'33"N, 44°25'16"E

This calls for a change in lens or logic, which echoes Zainab Bahrani's (2003) understanding of the ancient Babylonian and Assyrian writing system 'šalmu'. In Babylonian and Assyrian culture, a plural number of gods construct the divinity of their queens/kings through writing into them (coding their rank, abilities and destinies), as opposed to passing down their divinity via bloodline. Through this process, Assyrian and Babylonian queens and kings are encoded with the ability to write into the world and can bring new entities into existence. This is counter to the logic in regions of the world, which are developed under the monotheism model. In a system of a single God, monarchs are semi-divine and inherit their power through heritage. The resulting

epistemology assumes that images are unidirectional, they can only ever be poor mimics or copies of an ideal realm (God/heavens) that exists outside of representation. Bahrani posits *ṣalmu*, a form of Assyrian and Babylonian writing, as an alternative to this colonial monotheistic logic:

The relationship between *ṣalmu* and reality is not one that was considered to be unidirectional, as we might describe the functional movement of the mimetic image. According to the concept of mimesis, representation imitates a pre-existing reality. It is a process that entails a predetermined hierarchy of real to imitation and depends on the prior assumption of difference between reality and its doubles [...] *ṣalmu* does not aspire to mimesis as representation but functions instead according to what might be termed as the structuration of *différance*, similar to what I have described in the context of the logic of the script, as such, *ṣalmu* is better understood as a form of image that circulates within the real. (Bahrani 2003: 127–8)

ṣalmu is a language that combines text and image, in this sense it is diagrammatic, and through ritual it can bring new entities into being. According to Bahrani, Babylonian and Assyrian cultures could write presence and evidence a belief in the 'pluridimensional' and immanent ontology of the real (Bahrani 2003: 123). This also situates the Western European mode of interpreting *ṣalmu* as both problematic and exposing its own limits; the colonizer's logic could not recognise the Assyrian and Babylonian relationship with the real and misconstrued the text on artefacts, as descriptive rather than as actors in modes of becoming.

Aqueous Mapping: The Depths

Sunlight Zone

When I was young, twelve or so, I remember writing a poem that traced my body as it dissolved in the sea and was disseminated beyond the borders of its skin, traversing vertiginous depths. I have lost the notebook that enclosed it – I went on a search for it in dust-coated boxes but with no success. I know the text was connected to the family holidays we once took to the Llŷn Peninsula in Wales, as apart from a couple of trips to visit family in Denmark we didn't go abroad. Whilst mainly based in one of the largest land-locked counties without a city, we also for a time lived by the Irish Sea. My father and I used to be proud of braving the cold waters in October and February, I suppose from a hubris linked to an illusory mastery over our own or the sea's limits. However the limits of the Earth's resources are empirically evidenced, the term 'resources' highlights the inherent inequality in the relationship between user and used. I imagine that my twelve-year-old self was trying to produce a naïve script in which there was a more direct or authentic connection with the sunlight zone of the sea. A form of pan-psychism, in which I unwittingly pervaded the hydro-matter, a youthful slip into the belief that there is no distinction between thinking, materials and matter at all.

We are in the text, not outside of it, and are interwoven or folded into the matrix of the nature-culture script. Our modes of operating can be understood as forms of intra-action, as Karen Barad points out with the prefix 'intra' placing us internally in the fabric of the Earth as planetary actors that co-produce its materiality and meaning (Barad 2007: 56). This entails an alternative approach, one in which we write-with the planet. A script or score that is more like *ṣalmu*, the diagrammatical writing of Assyrian and Babylonian culture, in which the act of writing and imaging can bring new entities into being.

However, it also suggests that all planetary actors are co-authors, and the social fabric of the nature-culture continuum is not just written into unidirectionally by humans but in dialogue with environments. As Barad points out, the planet writes into humans, so we do not have a privileged objectifiable relationship with the real. We do not exist outside the meaning we make with matter, or the meaning matter makes with us, 'The fact that scientific knowledge is constructed does not imply that science doesn't "work" and the fact that science "works" does not mean that we have discovered human-independent facts about nature' (Barad 2007: 40). We are planetary actors co-writing the score of its biosphere, hydrosphere, atmosphere, and ecosystems.

Twilight Zone

It's 2003 and we are on vacation (I guess from studies and part time jobs) in Dubrovnik, Croatia. Despite the rented flat having a basement bedroom complete with damp and dehumidifier, we could not believe our luck that it backed directly onto the sea. It's twilight or just after, and the horizon line is dissolving with the sun. Looking out across the expanse, the black of the night sky is reflected by the sea, an infinite sea-sky that is streaked through with pyrotechnics drawn by the illuminations from ships. We are back at 'our' rock after sinking a few goldfish bowl gins, you know the kind... We have been here for five days, so my body is familiar with the outline of the rocks and the depth to the basin below. I recklessly dive off the rock into the inky black water, disappearing for a while to then emerge and clamber up on the deserted speed boat and wave back at my furious friends. On my return, I stand dripping and receive a right bollocking from one of my closest friends. To be fair, I had promised not to do something like

this earlier on in the holiday and it takes a day or so for the air between us to defrost.

A dimly lit and chilly arena for human life, known as the midwater, or mesopelagic region, the Twilight Zone plunges from about 650 to 3,300 feet. However, splashes of luminescence light up the deep, similar to fireworks in the night sky, and suggest a zone teeming with life. Recent research coming out of Cardiff University (2021) suggests that the 'marine snow', organic particles raining down from the Sunlight Zone, are preserved for longer in Twilight depths. This led to many species migrating to the lower depths over the 15 million period in which life in the Twilight Zone stratum is considered to have emerged. It is now believed that the biomass of fish in this oceanic layer is ten times greater than previously assumed. This is more than the biomass of marine life in the rest of the ocean combined and is largely made up of microscopic bacteria, zooplankton, crustaceans, fish, squid, and many kinds of gelatinous species.

In Percival Everett's novel, *Watershed*, the main protagonist, Robert Hawks, is a hydrologist who initially understands his relationship to the mapping of watery places (their levels, dissemination, and acidity) as apolitical. However, as he engages with people from the Plata Creek Indian Reservation (Everett 2003: 12), the watery place he has been employed to observe, he realises how implicated and distinct he is, as a Black American, in the water toxicity and its distribution across the reservation. Alaimo describes how this change in lens, or slip of the glasses, occurs enabling Hawks to register his embodied implications in hydrological processes:

Although Hawks holds a 'picture' of the terrain in his mind, making a material place a mental image, the medical image, conversely, maps the brain itself as a material place, writing being and knowing, liquids and nerves, within substantial networks. (Alaimo 2010: 69)

Hawks' recognition of his fleshy map, that his logic is being co-written while he investigates the environment, changes his relationship and responsibility to the reservation. Later in the novel he stumbles across a dead elk, and further on, an undocumented dam that is redirecting polluted water onto the Plata Indian Reservation and away from the area of mainly white inhabitants.

Midnight Zone

Imagine a lightless abyss that cannot be penetrated by sunlight, it is even darker than the Twilight Zone that seemed black to the naked human eye. Denser than this is the Midnight Zone, a blackness that troubles the coordinates required for ascension. Also known as the Bathypelagic Zone, humans consider this layer as making up 70 percent of all seawater. At these depths, it keeps a consistent temperature of 4 degrees Celsius or 39 degrees Fahrenheit. It has a hydrostatic pressure that varies with depth but ranges from 100 to 400 atmospheres. Human-occupied vehicles (HOVs) still travel to these depths, but many expeditions are undertaken via remote-operated vehicles (ROVs). ROVs are tethered to ships with fibre-optic cables and are remote piloted to collect water samples, organisms, video, and photographs. However, the intra-action between artificial light from an ROV and a dark habitat would likely alter species behaviour so imaging systems are being developed to use red-filtered light. This is because humans believe that the visual systems of species in the Bathypelagic Zone cannot detect red wavelengths, thus

rendering it invisible to these marine inhabitants. A key area of interest for humans is how the Midnight species adapt their visual systems and communicate through bioluminescence. Previously it was assumed that there were few microbes in this zone, but recent studies have found abundant life including bacteria, archaea, and viruses. These are particularly important to their terrestrial counterparts because these actors could play an extensive role in the carbon cycle and may help to address climate change.

Abyssal Zone

Chen proposes that mapping watery place is best practised through producing a plurality of iterations in relation to situated waters with maps that are overlapping and constantly re-performed (Chen 2013: 293). One such practice is the toponymic approach to mapping found in traditional Inuit cultures (indigenous to the Americas), which embeds the cartographer in the terrain. Toponymic mapping ranges from reading snow and deciphering luminous clouds on the horizon, to carving driftwood to produce portable tactile objects that can be traced by mittened hands when weather decreases visibility (Chen 2013: 290). These maps are mutable and re-iterated for different circumstances, changing places, imperatives, and perspectives.

At 13,000 to 20,000 feet, the Abyssal Zone is defined as covering 83 percent of the total area of the ocean and up to 60 percent of the Earth's surface. Also known as the Abyssopelagic zone, the term comes from the Latin 'abyssalis' meaning either bottomless or extreme depth. Human occupied vehicles (HOVs) have enabled small groups of people to collect samples, travel through geological features and make maps using robotic arms. However, not many HOVs can descend to

the abyssal seafloor. Therefore, autonomous underwater vehicles (AUVs) are deployed, as well as the ROVs used in the Midnight Zone above. AUVs are pre-programmed submersibles that do not require human operators, physical or remote and they are equipped with imaging systems, probes, and sensors. This enables researchers to map and collect data in what is an extreme underwater terrain for humans. Minerals valued by human industry, cobalt, nickel, aluminium, and manganese, can be found on the abyssal ocean bed. They are used to manufacture consumables such as cars, wind turbines, phones, and laptop batteries. Many nations are exploring technologies that will enable them to mine these minerals from the floor, as well as the nodules or seamounts that are coated in cobalt-rich crusts and the vents that are glazed in copper, zinc, lead, silver, and gold. However, the microbes down here, similarly to the Midnight Zone, are likely impacting the ecosystem through their involvement in the carbon cycle. It is necessary to explore these microbes alongside the mineral rich abyssal floor, as deep-sea mining would impact these microscopic communities, possibly stirring up and damaging the latter. This intervention could reverberate through the hydrosphere and into the global carbon cycle.

The slice of fluid-ground that makes up the layers of the Pelagic Zone requires the overlapping and re-performed mapping suggested by Chen. We could consider the different perspectives of the actors in the intra-active realm of the Abyssal Zone, including but not limited to, colossal squid, pelican eel, humpback anglerfish, bacteria, microbes, minerals, chemical elements (nitrogen, phosphorus, silica), salinity, human interventions (or second body), technological apparatus, and machine vision. Through re-performing maps, we can gain an

awareness of these watery places over time and understand how our own perceptions change in relation to this recording of slow and fast transformations. However, two-dimensional maps can always fall fowl to a distancing in which we are outside, so that the cartographer and reader are not implicated in their ecological, social, and political flows. Maps wire us and thus mapping requires a rewiring if we are to change our relationship to looking, knowing, and writing with water.

What if we were written into watery terrains and we could slip into this hydro-mapping, feel it against our skins? As co-authors, we could then descend into the terrain of the map that our bodies of knowledge are sited in, making meaning-with water. A topography of felt information, the stories of which invite our porosity as we record-with the changing transgressive potential of watery places and their variations.

Hadal Zone

Descending into the Hadal Zone, we dip below the Abyssal Zone into a series of 'V' shapes. These Vs act like knives that cut deeper into the oceanic basin, they are rifts caused by one tectonic plate being subducted under another. These submarine gorges can extend to depths of 36,000 feet, and provide temperatures that linger at just above freezing. Otherwise known as the hadalpelagic region, it gets its name from the Greek god of the underworld. Combined across all oceans, the Hadal canyons make up an area analogous to the continent of Australia. Researchers are working to develop technologies that can withstand the remoteness, topography, and pressures of the Hadal Zone, even partnering with NASA's Jet Propulsion Laboratory. Certain AUVs are being developed to withstand pressures greater than 1,000 times that found at the ocean's surface

and can navigate slim cavities with sharp materials and angles of the trenches. They can work autonomously or in swarms, to map the water, seafloor and the organisms that inhabit the Hadal Zone. It is even possible for them to respond to contingencies and reconfigure their mission if they encounter the unexpected.

The steep walls of the Hadal Zone house lifeforms found nowhere else on Earth. Perhaps mapping the organisms that acclimatize to extreme environments gives terrestrially bound humans hope in our own adaptation to climate change. Many organisms of the Hadal Zone rely on the chemical-rich fluids emitted from hydrothermal vents. Many others depend on the carbon-based matter that falls from the upper layers of the Pelagic Zone as 'marine snow'. Like the Abyssal Zone, an accumulation of carbon in the Hadal Zone gorges may play a role in climate regulation and the carbon cycle. NASA's involvement in marine research becomes apparent, as scientists and corporations with dreams of life in other areas of our galaxy are also interested in exploring the Hadal Zone as it may have similarities with the conditions found in oceans on the moons of Jupiter and Saturn.

Returning to Leah, our fictional submariner, and her wife, Miri, who is left on dry land, the Capitolocene imperatives and anthropocentric thinking may try to call us back from a logic of 'viscous-porosity' (Tuana 2008: 200). Miri echoes this temptation when she remembers a conversation with her wife, "'Sometimes I think you prefer it down there", I said to her, holding her face in my hands and wondering whether I meant it to sound like a joke or a reproach, "*you go so deep you forget you're supposed to come back*"' (Armfield 2020: 85). This betrays a concern that going 'down there' will lead to a getting lost, a

forgetting, in which we lose our autonomy or are beside ourselves. Allowing ourselves to be written into as we write, will entail a loss of distance that is required to conserve the self and objectivity because the outside is already inside. However, descending never to re-surface, does not mean that we cease to be able to identify coordinates or make meaning, we do not lose sense but change how we sense, who we make sense with and what makes sense. When writing-with the depths, flows and places of water, we need to change our perceptual lens so that we do not fall into the trap of writing over or further instrumentalising water. Rather than pushing for the Capitalocene's notion of time, which manipulates water and pushes the globe beyond its limits, we are called to sense and make meaning with matter. We need to learn to co-construct folds with aqueous fabrics and to undertake a more horizontal co-authoring with the geological gradations of fluid ground.

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