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**Grief and the Blue Humanities: an  
Oceanic Exploration through the  
Metaphor of Medusa**

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## **Abstract**

This thesis will be an underwater exploration through the more-than-human Ocean. In order not to drift away in the vastness of the Ocean, we will turn to an anchor point: the metaphor. My metaphor method will be the Medusa, and it will be articulated in three different tentacular bodies. We will swim from more literal to more abstract currents as the chapters develop. The name "Medusa" embodies a plurality of meanings, serving as a symbol for various objects—from the sexually reproductive pelagic stage of jellyfish to the infamous French raft, to the mythological figure from ancient Greece and her petrifying gaze of stone. Each element, akin to tentacles, offers a stinging grip for delving into the obscure waters and gazing at inconvenient truths that intertwine with human activities. As I shed light on issues that are normally dealt with in different disciplines, my aim is to disclose the profound entanglements of anthropogenic impacts on the Ocean, with the purpose of finding constructive and creative responses in the face of ever spreading ecological grief and loss.

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It is a curious situation that the sea, from which life first arose, should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist; the threat is rather to life itself.

—Rachel Carson, *The Sea Around Us*

I am the Ocean

I am the sea

There is a world

Inside of me.

—Bring Me the Horizon and Lights, *Crucify me*

## **Introduction – Epipelagic waters: a drop in the Ocean**

This thesis is an oceanic exploration pertaining to the field of the Blue Humanities, where one of the most powerful tools employed to generate new narratives of the Ocean is the metaphor. Much like the name Medusa itself carries a plurality of meanings, my research will be conducted with a hybrid metaphorical method inspired by the name itself. Medusa can refer to the sexually reproductive pelagic stage of most jellyfish's lives; it is the name of the raft involved in the infamous shipwreck that became the symbol of French Romanticism; it is the ancient Greek mythological figure with snakes for hair and a petrifying stare. Inspired by the sixth and seventh principles of Ocean Literacy, I will dive into the more-than-human Ocean to explore several complex issues of the contemporary. In particular, I will swim through jellyfish blooms and their ecological impact, I will embark on ships from different epochs to retrace forced migration and slavery, and then I will search for chthonians on the oceanic floor to look deep sea mining in the eye. In addition to this, each chapter will be associated with different depths of the ocean: after having swum through the epipelagic shallow waters of this introduction, I will navigate mesopelagic, bathypelagic, abyssopelagic and hadopelagic layers of currents.

We will be navigating the Ocean, a vast place. The vastest on the planet. It can be a place of safety or refuge, and to some it is a place of worship. Maybe, to most bodies that inhabit it, it is just water. Or do they even realize they are immersed? For some bodies, the Ocean is a meeting place. For others it embodies a huge hiding place to conceal what we want to forget or leave behind. But whatever finds its way down the waters will find its way back somehow, assembled in new evermorphing chunks and compositions. Shapes and colors from above and below form the turbulent body of water that pushes heavily onto the seafloor. The water envelops the sunlight, filtered and refracted into warm rays until it gets lost in the cold dark depths.

The Ocean is a place of wonder. Its body extends far and wide, arms so big they wave in tumultuous and bubbly currents crushing and crossing far and wide all sorts of waterscapes. The Ocean is a morphing body that never stays

still. After all, what body stays still? What even is a body? A popular definition of the body would be that it is “a mass of matter distinct from other masses” (Merriam-Webster), and the etymology of the word Ocean, although uncertain and complex, fits with this definition. Coming from the Latin *Oceanos*, the word seems to derive from the Sanskrit O’GAS, “water”, or from ÖGHA, meaning “reunion, mass, mass of water, river that gushes and drags”. Another interpretation that comes from the Vedic Sanskrit word AÇAYĀNA gives it more connotations, carrying the meaning of “container, constrainer”, defining the Ocean as a body that contains rain and encloses every corner of the Earth. Seeing all the nuances to the meaning of this name, can we really say the body is a distinct mass of matter? The Merriam-Webster dictionary provides many other definitions, my favorite one being “something that embodies or gives concrete reality to a thing”, which I believe fits much better with the complexity of the Ocean.

The Ocean is an encompassing body that lives all around and gives all its inhabitants a complex reality, hence why I would not necessarily agree with it being closed. No body is a closed system. A body is open, constituted of membranes, cavities, tentacles, vents, matter and energy flowing in and out with every movement, in an everlasting breath. The Ocean never stops breathing, hovering above all latitudes and longitudes; a powerhouse and a haven for an endless plethora of other bodies, changing according to their preferred climate or their displacement such as plankton, ice, plastic, ctenophora, mineral nodules, tentacles, hydrothermal vents, barnacles, ghost nets, jellies, sea snail, sunken ships.

### **a. Mediated human experience underwater: our ambivalent perception**

The pressure of the water, the filtered light, and our altered sensory perception underwater make the Ocean seem like an otherworldly dimension. To human ears, underwater sounds are muffled and mouths are muted. Touch works differently when the entire surface of my body is immersed in water. It does not feel like the water is touching me, and yet the contact is far from imperceptible. Our sight needs to be technologically mediated to function the same way it does



above the water. Taste and smell seemingly lose their function when I am surrounded by blue. Author Bloomfield (2019) writes that

The “strange agencies” of the sea itself thus invite contemplation of more-than-human modes of being, most especially because marine habitats are so inhospitable for humans. Media theorist John Durham Peters observes how marine environments radically transform gravity, light, and sound, forming [...] a radically inhospitable medium for the human sensorium. (513)

The sensorial alteration is what causes our brains to perceive reality in a different way when immersed, swimming through inexistent borders, blind spots, pocked seafloors and trenches. Up and down do not carry the same meaning they do out of the water, and when you are sliding through the seaweed neither do left and right. Underwater, the body changes its substance, it moves under different rules. Space shifts into a dimension where our bodies do not perceive gravity the same way, allowing for more freedom of movement and of sensation. But in deeper waters, pressure becomes harder to bear. It limits movement rather than enhancing it. Down there, as pressure increases, light decreases and so does temperature, generating an environment where time seems more loose. All bodies need to measure their actions, living with slower paced heartbeats and contained movements.

When we are underwater and we realize how different our perception of time and space becomes, we find ourselves immersed in a sea of questions we cannot answer. In fact, the feeling that time and space work differently when engulfed in water is the reason why stories about the Ocean have always been ambivalent. On the one hand, flowing and floating through the cold water, the light, the corals, makes us feel a sense of wonder and belonging. The epitome of immensity and freedom, the Ocean is the secret protagonist of an endless array of stories of exploration from all over the world. On the other hand, this very sense of wonder is ungraspable in a way that is awe-inducing, an ambivalent feeling the Romantics would have called sublime.

The unfathomable nature of the powerful bond between our bodies and the Ocean is exactly what makes it attractive and dreadful at the same time, to the point that the Ocean often represents a symbol of irrational fear for the

unknown as well. So much so that during the 17th century, at the dawn of the age of Enlightenment, English poet John Milton wrote that while air is the realm of reason and morality, the waters are deep and gloomy: the ocean is “dark and illimitable”, a world “without bound [. . .] where length, breadth and height, and time and place are lost” (Milton 1841 quoted in Hayward 2012, 165). The Ocean has historically been seen, and still is today, as “an abyss, a space of oblivion, and a graveyard” (Han 2019, 466). In the words of author Steve Mentz, the Ocean is simultaneously *Alien* and *Core* to us humans. The Ocean is an “inhospitable home”, where we experience a relationship of “tension, urgency, dependency, and fear”, but which so many of us feel attached to (Mentz 2020, 19). When he swims, he perceives more intensely the meaning of *Alien* and *Core*: he feels he is an inadequate terrestrial creature, only partially comfortable in water, who holds on to wavy repeated movements that allow him to stay afloat; at the same time he embodies liquidity, a body that is looking for a dynamic balance with the surrounding waters (Mentz 2020, 21). We are both things, all the time. Water is simultaneously a reverie and a cursed place of perdition (Oppermann and Iovino 2015, 312). All in all, whether positive or negative, or rather both at the same time, the Ocean cannot but elicit a strong emotional response shaped in a complexity of forms.

### **b. Overcoming the schism between science and emotions: Ocean Literacy and the Blue Humanities**

Historically, this ambivalent pulsing emotional response to the Ocean has not been included in oceanographic studies. In fact, despite the astonishing steps made forward in this direction, our knowledge of the ocean is still much smaller than the importance it has in our daily lives (Carson 1961, xx), resulting mostly in a detached relationship from it. Certainly, the absence of emotions in this area of science is part of a broader trend across scientific disciplines, where emotions have historically been excluded from scientific inquiry. In fact, this exclusion reflects the persistent goal of obtaining objectivity, a foundational principle of the scientific method. The modern emphasis on detachment aimed to eliminate subjective influences, including emotions, to establish a sense of neutrality. Indeed, neutrality is the base criteria for a successful scientific

practice focused on quantifiable data, observable phenomena, and replicable experiments that could be unbiased, rational, and uncompromised by the unpredictability of irrational emotions. Seeing how these trends developed during the Modern Age through Enlightenment first and Positivism after, Western society has been the author of a schism between scientific disciplines and humanistic ones, the former only aiming at studying the environment and nature around us from an external standpoint that rises above all else. The Ocean was not excluded from this mindset, and fell mostly in the first category.

However, “objectivity is but a hallmark of truth”: it is an illusion of truth, because truth is unattainable (Ingold 2018). In fact, contemporary discussions within different areas of study increasingly acknowledge the limitations of complete emotional detachment. Emotions, far from being impediments to scientific rigor, can serve as valuable lenses through which to understand and engage with complex phenomena, including oceanic systems (Jones 2007; Ingold 2018). Acknowledging emotions within scientific inquiry doesn't imply replacing objectivity with subjectivity but rather recognizing emotions as an inherent aspect of human experiences. Since humans do not simply watch from the outside, but are part of the environment, acknowledging our emotions shows their potential role in shaping perceptions, motivations, and ethical considerations related to scientific inquiry.

The schism between alleged objectivity and subjectivity reached so deep in contemporary culture that it did not just influence the realm of research, but reached the field of education as well. In 1996, when the *National Science Education Standards* was published in the US, experts from the ocean sciences and ocean education communities were “dismayed to find that there was little mention of ocean topics in the content standards” (Schoedinger et al. 2010, 3). This was a significant point of rupture: it was the starting moment of the path that in the following decade would culminate in the development of the educational framework of Ocean Literacy titled *Ocean Literacy: The Essential Principles and Fundamental Concepts of Ocean Sciences K-12* in 2005 (Schoedinger et al. 2010, 3). This document includes the guidelines to implement the main values of oceanic conservation in school education up until grade 12. The effort kept going and culminated in 2009, when the

community-wide process of consensus building led to the formulation of the *Ocean Literacy Essential Principles and Fundamental Concepts*. This guide establishes, by agreement of hundreds of scientists, educators, and policy makers, “what every person should understand about the ocean by the time they graduate high school in order to develop an ocean-literate society” (NOAA 2020, 1).

In that period of time, Ocean Literacy became an increasingly prominent theme within oceanographic institutes throughout the world. Notably, the Consortium for Ocean Science Exploration and Engagement (COSEE), the American National Oceanic and Atmospheric Administration (NOAA), the National Geographic, Sea Grant and UNESCO’s unity Intergovernmental Oceanographic Commission (IOC). All these institutes started implementing oceanographic educational initiatives, educational programs, and policy frameworks. The basic assumption is that Ocean Literacy is defined as “an understanding of the ocean’s influence on you—and your influence on the ocean” (NOAA 2020, 1). In addition to this, the UNESCO guide reads that “ocean literacy aims at facilitating the creation of an ocean-literate society able to make informed and responsible decisions on ocean resources and ocean sustainability” (Santoro et al. 2017, 16). The establishment of these norms majorly developed in the following years. In fact, in 2020, the NOAA guide put emphasis on the emotional relationship between people and the Ocean:

Participating in real and virtual experiences with ocean and coastal environments helps learners build personal connections that motivate them to become ocean literate and act on behalf of the ocean and freshwater systems. (3)

This approach gives room to a reevaluation of the role emotions play in research, consequently in education and, more in general, in life. This change is fundamental for a move towards a holistic approach to Oceanic conservation, especially when dealing with themes such as ecological grief and exploitation. It represents a shift from the standard paradigm, where we seemingly had forgotten that “to neglect the emotions is to exclude a key set of relations through which lives are lived and societies made” (Anderson and Smith 2001, quoted in Jones 2007, 496).

Today, the fundamental principles of Ocean Literacy are seven. As they all touch upon the size, wonder, importance, and mystery of the Ocean, to me they are all evocative of the duality touched by Milton, Mentz, Oppermann and Iovino, and many other authors:

1. Earth has one big ocean with many features;
2. The ocean and life in the ocean shape the features of Earth;
3. The ocean is a major influence on weather and climate;
4. The ocean makes Earth habitable;
5. The ocean supports a great diversity of life and ecosystems;
6. The ocean and humans are inextricably interconnected;
7. The ocean is largely unexplored. (Santoro et al. 2017, 19)

Besides principle one, which I have already touched upon when I talked about how the Ocean is but one big body, the two other principles that I was mostly inspired by were the sixth and seventh. Principle six underlines how humans and the Ocean are indissolubly tied together. It brings me back to the idea of closeness, of relation, of emotional connection. From my bodily experiences underwater, and my feeling of belonging to the blue world, I can feel that I am inextricably connected to the Ocean—it is *Core*. On the other hand, the seventh principle elicits a series of mixed feelings within me. Not only does it convey a sense of urgency to discover more, but it is also overwhelming. In fact, we do not know much of the farthest parts of the Ocean and its inhabitants, the parts where it is all dark, cold, and heavy—it is *Alien*. It is at the crossroads of these uncharted realms, and endued with emotional sensitivity, that this thesis plunges into the abyss.

The Ocean Literacy program is admirable, because its initiatives can give factual results while simultaneously valuing the emotional relationship between people and the Ocean. However, I believe that Ocean Literacy as a framework is not sufficient for the task it aims to fulfill. It is not surprising that educational efforts concerning the environment often focus on children and young adults. However, it is unrealistic and unfair to place the responsibility for ocean conservation solely on future generations (Pahl et al. 2017 as quoted in Kelly et al. 2022). Everyone needs to be involved, and while the principles of Ocean

Literacy are broadly applicable to the general adult population, there is a need for a more comprehensive way that can be used by diverse groups across various socio-demographic backgrounds.

I do not believe that this more comprehensive way should be a tool in a strict sense: in fact, the framework is still a framework, hence approached with the need for clear methodologies to be carried out in a way that can be considered “successful”. If a methodology is “a rigid set of procedures expressly designed to immunize researchers from direct contact with the materials of study” (Ingold, 2018), then the involvement of emotions is dysfunctional, because despite emotions’ fundamental importance in the experience of the environment, they do remain impossible to measure, so any pragmatic result is indeed not obtainable nor replicable. For example, someone who feels they are part of nature might be invested in initiatives aimed at preserving the Ocean even if they live far from it, maybe even more invested than someone who lives close to the Ocean but is personally too busy to even see it: there are no causal, spatial, or temporal correlations that are linear. This kind of investigation would end up being another hole in the water. To better convey the values of scientific communication “we may need to deviate from the linear science supply paradigm and rather produce some science directly targeting societal values” (Dupont 2017, 1211). Indeed Ocean Literacy should become a lifestyle to be effective at its full potential—it should be a matter of emotions.

This is especially true if we consider the time we are living in. The Anthropocene, an era “marked by human activity and expansion in unprecedented ways” (Eriksen 2016, 17) plays a significant role in Ocean exploitation. Hence we need a critical standpoint that acknowledges this fact and allows us to understand the Ocean as a “more-than-human assemblage” (Steinberg 2013 quoted in Bloomfield 2019, 503). At the same time, we need to stay in the water, swimming and floating. In fact, an enmeshment between cultural history and natural history is desirable to “recalibrate the gauges of time and space” (Blum 2015 quoted in Bloomfield 2019, 503), and even more so underwater, because it means “engaging ocean worlds as natural-cultural assemblages and negotiating varying human and more-than-human scales” (Bloomfield 2019, 504).

Feeling close to the navigation routes of the Blue Humanities, my aim with this thesis is to unveil some of these intricate more-than-human truths and to look at them with more-than-human eyes. To bring the Blue Humanities, which are indissolubly tied to science studies and they need to reciprocate their energy (Alaimo 2019, 429), to swim alongside Ocean Literacy, to generate oceanic empathy and compassion. It is not rationalized hard sciences alone that can connect us to the ocean, they do so when they swim alongside the stories, the images, the histories. As biologist and social entrepreneur Kerstin Forsberg said:

The ocean is present in our daily lives. It is fundamental to each and every one of us, every single moment, even if we have never seen it before. The ocean is the beating heart of our planet, our life support system. [...] Often, people mistakenly think of the ocean as a blue carpet, something far away from us, a place with infinite resources. But the ocean is not like this. [...] [T]he ocean is home to 99% of our planet's habitable space; our ocean teems with life [...]. And all this life, in one way or another, is ultimately connected to us, through nutrient cycles, direct human activities, and much more. (IOC-UNESCO 2022, 37)

### **c. The Blue Humanities to cope with anxiety, worry, and environmental grief**

An emotional connection with the ocean is not to be sought after only through positive emotional responses. The Ocean can elicit many emotional responses that are dreadful. But a sense of belonging and desire for protection might stem precisely from this kind of emotions, such as anxiety, worry, or grief for all we have lost and are losing. Anxiety and worry, often examined clinically, are typically linked with negative outcomes like reduced well-being. However, early research highlights their potential for constructive problem-solving, acting as emotional motivators that enhance alertness and analytical thinking (Ojala et al. 2021, 38). Recent studies, controlling for trait anxiety, reveal nonclinical worry's positive association with problem-focused coping and information-seeking cognitive styles (Ojala et al. 2021, 38). These findings resonate with political psychology, suggesting that anxiety and worry facilitate deliberation and critical thinking, serving as initial steps in engaging with broader societal issues. Thus,

beyond their clinical context, these emotions play multifaceted roles, promoting proactive approaches to problem-solving and fostering critical engagement with societal challenges.

As opposed to sadness, which is more linked to resignation, grief involves a sense of struggle, so it can be an active adaptive response (Ojala et al. 2021, 38). In particular, ecological grief is perceived in front of environmental degradation and the loss of a beloved environment. Cunsolo and Ellis (quoted in Ojala et al. 2021, 40) categorize environmental grief in three different ways: in front of a loss of ecosystems, landscapes, or species due to acute events; in front of disruptions to environmental and place-based knowledge and identities, impacting one's connection to landscapes and ecosystems; and based on anticipatory grief for future losses of ecosystems, lands, species, and related cultural and knowledge systems. In the chapters of this thesis, all three categories may apply.

In order to be able to see the enmeshment of the contemporary Ocean, we need to give it a body. We must look into the complex web of our globalized world order—one that operates at an accelerated pace, often at the expense of environmental and social disenchantment (Eriksen, 2016; Ghosh, 2016). To swim deeper into these systemic issues and foster a comprehensive understanding, it becomes imperative to engage with the political dimensions of these feelings. The intricate web of global trade, labor practices, and environmental policies intertwined with oceanic exploitation often operates within political frameworks that cannot keep their feet dry: they need to be added to the wet circle. To do this, I want to swim through the waves of the Ocean, an Ocean that I love with all of the entirety of love. I feel Thalassophilia and I embrace it as I embark on this exploration:

Thalassophilia, the love for the oceans, is a love that knows to grieve and mourn. Moreover, it knows that grieving is not solitary melancholia, nor nostalgia for a pristine past, but part of a practice that seeks to repair the connective fluids of existence. It gives comfort and cleanses sorrow. It douses the flames of anger. Return, remediation, and replenishment offer possibilities of re-forming the world as it used to be, but not in the way of a return in time, but in possibilities. (Zyman 2022)



Following the flowy navigation of Thalassophilia, I could not establish a geographical and temporal focus for my thesis, especially because “Earth has one big ocean with many features”. There is one means I tend to use in my writing, one that is much more forgiving than history and geography: poetry. Most notably, the rhetorical figure of the metaphor, which connects different bodies and routes allowing me to navigate through different thematic and geographic areas of the ocean. I believe the metaphor works effectively as a cognitive tool that can connect dots in ways that are endless and not automatic. The metaphor is a key tool for this purpose in the Blue Humanities (Oppermann 2019). Poetry can help us envision wavy modes of cultural engagement with the more-than-human Ocean thanks to its “forms of juxtaposition, linkage, linguistic porosity, indeterminacy, and non narrative temporalities” (Bloomfield 2019, 500). To me, the metaphor is pivotal in the figuration of narrative temporalities that are non linear. Climate change, global warming, extinction, are all hyperobjects, facets of reality so complex they are hard to fathom. The metaphor will shape the bodies of these hyperobjects, functioning like a compass at open sea.

#### d. Medusa as methodology: navigating different depths

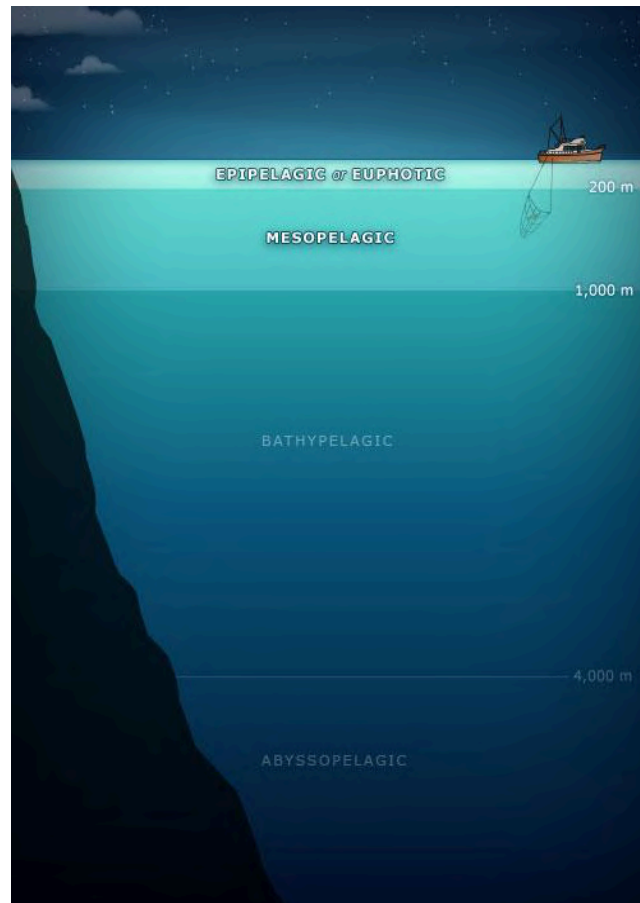


Figure 1. Carl Walrond. *Pelagic Waters*. Te Ara - the Encyclopedia of New Zealand. 2006.

Chapter 1 will drift through the most literal Medusa, which is the sexual phase of most jellyfish's life cycle, with its mellifluous tentacles. Drifting in relatively shallow waters, I will portray how jellyfish are masters of adaptation in anthropogenic disturbance. Present on Earth for more than 500 million years, their adaptive skills have shown so much resilience that they can embody a metaphor for the tight entanglements and unexpected consequences of the Anthropocene. They *are* the more-than-human Ocean. My purpose with this chapter is to face the new truth of our accelerated world (Eriksen 2016) as it manifests in our Ocean. To delve deeper into the evolution of jellyfish in times of crisis and accelerated change, I was primarily inspired by Lisa-Ann Gershwin (2013, 2021) and the *Feral Atlas* by Anna Tsing et al. (2021). This chapter, since I did not personally conduct ethnographic research, offers an overall

disembodied perspective. However, much of the literature I draw from is embodied, so the final perspective is a synthesis of both. There are ethnographic and biological descriptions (Carbonell 2021; Fach et al. 2021; Gershwin 2013; Vodopivec et al. 2021) and anthropological and philosophical speculations as well (Gershwin 2013; Berwald 2017; Haraway 2016; Tsing et al. 2017).

The ecosystems we alter, jellyfish can literally destroy, floating and displacing through ocean sprawl, overfishing, eutrophication, climate change, pollution and globalized markets. This aligns with the understanding of trophic chains and networks, because “in the reality of nature, a fish species is not a discrete and static concept; it is many intersecting forms of organization, from biochemical compounds to organs, which give order to energy” (Stopnitzky 2022). Studying jellyfish’s behavior is a brilliant example to breach into the nature/culture dichotomy: if we consider nature as untamed, then jellyfish’s uncontrollable and untamed spread can definitely be considered natural; however, if we consider that they become more untamed the more anthropogenically impacted an environment is, then their behavior stops being considered natural. Where most species experience extinction, jellyfish thrive. For these two reasons, jellyfish’s ways of living can be placed right in the middle of the natural-cultural continuum (Haraway 2016). Using this conceptualization, we see how we cannot but define the Ocean as more-than-ocean, and the jellyfish that inhabit it as natural-cultural.

Chapter 2 will set out to more unexplored waters, waters that are further from the eye of most of the human population. The starting point of this metaphorical conceptualization will be the Raft of Medusa, the infamous shipwreck that, thanks to the expert and gracious hand of painter Théodore Géricault, became the emblem of French Romanticism. In this chapter we will navigate retracing oceanic routes and explorations which were, for most of humanity, also stories of colonization and imperialism. The metaphor here will lie under the keel of our imaginary Medusa ship: as we move towards higher depths, we see and mourn all the bodies that were killed in the trade, those that are still dying today on migrating ships and those of clandestine workers on container ships, sinking deeper and behind the routes they were forced to follow.

Chapter 3 will plummet down to dark and cold depths of the abyss. Down here, I will ask for the help of the petrifying eyes of Medusa, the Greek chthonic deity with snakes for hair and a wronged soul. I will ask her to swim with me to the bottom of the ocean and visualize the polymetallic nodules and other deep sea resources. We humans tend to assume our extractive industry as normal and necessary, and in doing so, we follow the traditional division of the biopolitical force which considers that “human and more-than-human natures are bifurcated and the nonhuman ones are represented in ways that suit the interests of global economic systems” (Reid 2022, 75). We tend to abstract these nodules as immobile bodies, with little to no use for their environment, bodies that are just there for us to extract. But unlike the immobile bodies rendered stone by Medusa's eyes, these nodules have existed in their environment for an unbelievable amount of time and will continue to do so as they are the home to incredibly delicate ecological niches. They have roles in their ecosystem and in trophic chains as well, but we are at such a premature state of our deep sea knowledge that we cannot even predict the damages of extracting them. So, this chapter will state how deep sea mining is not a solution to our metals and rare earth elements supplies, but rather a suicidal mission.

The aim of my thesis isn't to serve as a prescriptive guide or framework, but rather to create a compendium, an *exploration* of the narrations that resonate with individual experiences, cultures, histories, stories and mythologies evoked by the Ocean, trying to dip our toes in just a few of the endless potential intertwinings we can make with the blue planet. This thesis will be a drop in the Ocean of the Blue Humanities, bridging Ocean Literacy, emotional and ecological elements that often escape conventional scientific narratives. Invoking Medusa, the archetype of petrification, makes it impossible to predict what the results of the journey will be:

The related methodological question is “how [can we] identify, out of the vast array of textual traces in a culture, which are the significant ones, either for us or for them, the ones most worth pursuing”, a question that comes with the caveat that “it proves impossible to provide a theoretical answer, an answer that would work reliably in advance of plunging ahead to see what resulted. (Bassi 2016, 161)

I like to think similarly to Tim Ingold's fashion: not being able to know where I will drift to is a stringy (and stingy) flow that opens up imaginative scenarios in our brains and sensoriums.

I hope that my oceanic exploration will convey the pain and atrocities humans and the Ocean witness and suffer because of human action, forming chunks of meaning that keep readjusting and shaping new truths in the more-than-human Ocean. Inspired by the 6th and 7th principles of ocean literacy, and mesmerized by thalassophilic metaphors, my method-less aim is not to fuel hopelessness, but rather to stimulate constructive reactions and critical thinking in order to look into these themes that are so often concealed to the wide public, despite having true impacts on everyone's lives. Now let us dive in...

## Chapter 1 – Mesopelagic waters: cannot keep jellyfish at bay

Ever since I was a child, I have had a fascination with the Ocean. It is impossible for me to keep away from the water and the diffractions of light hitting its wavy surface. I feel this attraction towards sea inhabitants too, with all their shapes, colors and watery mysteries. For as much as I have always pretended to be a fish, my body could never move as effortlessly and smoothly as they do. To me, the epitome of sinuous and graceful underwater movements has always been the jellyfish. The attraction I feel towards them is as strong as the dread to be stung. With their bodies, jellyfish carry forward the dichotomy of the Ocean as simultaneous *Alien* and *Core*, drifting in colorful, slimy, stingy, deep, grim entanglements of endless iridescent and voracious pinpricks.

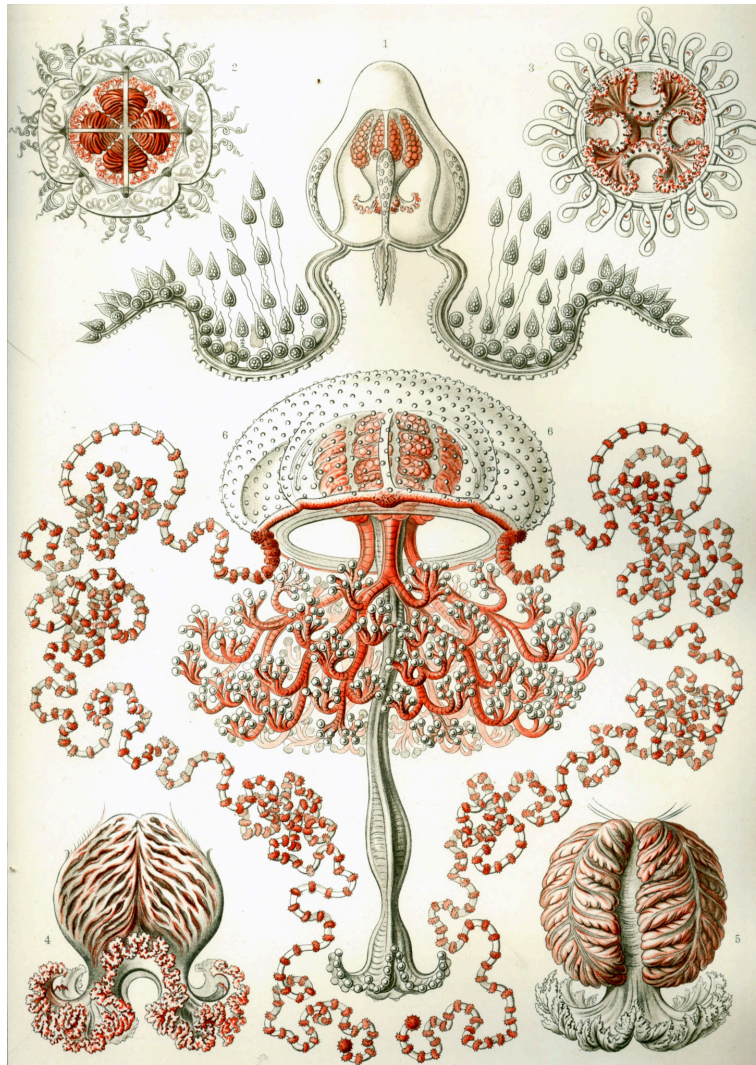


Image 1. Ernst Haeckel, plate 46: Anthomedusae, from *Kunstformen der Natur*, 1904.

Both pelagic and benthic, both attractive and repulsive. If we let ourselves be inspired and look through their gelatinous and transparent bodies, we can see how they become a lens, an embodying metaphor for the Anthropocene and its disruptive powers in the more-than-human Ocean. So much of their tingly bodies, biology, and habits has developed as a response to anthropogenic expansion, be it physical, or technological, or both. There is a quote from marine biologist and jellyfish enthusiast Lisa-Ann Gershwin that strikes a curious balance between amusement and gloom. In an interview with Ingo Niermann on the TBA21–Academy podcast series *Ocean Wants* titled “Rise of Slime” (2021), she humorously remarked that “all roads lead to jellyfish”. During the interview, Gershwin highlighted that current modeling studies unmistakably show that human activities exploiting the Ocean—ranging from overfishing and water pollution to indirectly contributing factors like climate change—result in increased jellyfish populations. As I will elaborate in this chapter, we will see how jellyfish’s actions get destructive paired with anthropogenic conditions. As Hayward (2012) brilliantly put it, “jellyfish and humans work hand in tentacle to destroy ocean ecosystems” (180).

### **1.1 – Peculiar biology: jellyfish are double in their nature**

Drifting, tentacular, and gelatinous zooplankton: meet jellyfish. They are classified as belonging to the biological phylum Cnidaria which comes from the Greek κνίδη (kníde) meaning “nettle” — because they sting. Depending on different criteria for species recognition, the Cnidaria phylum can be considered very big or very small. Gershwin accepts the broader definition of the category and identifies four main groups (see Image 2): the Medusae, the one with a cute dome and scary tentacles most of us are familiar with; the Siphonophora, colonial creatures among the most venomous on the planet; the Ctenophora or Comb Jellies, translucent little ghosts that are widely regarded among the most invasive species; and Salps, another type of colonial creature that looks like an otherworldly rainbow chain.



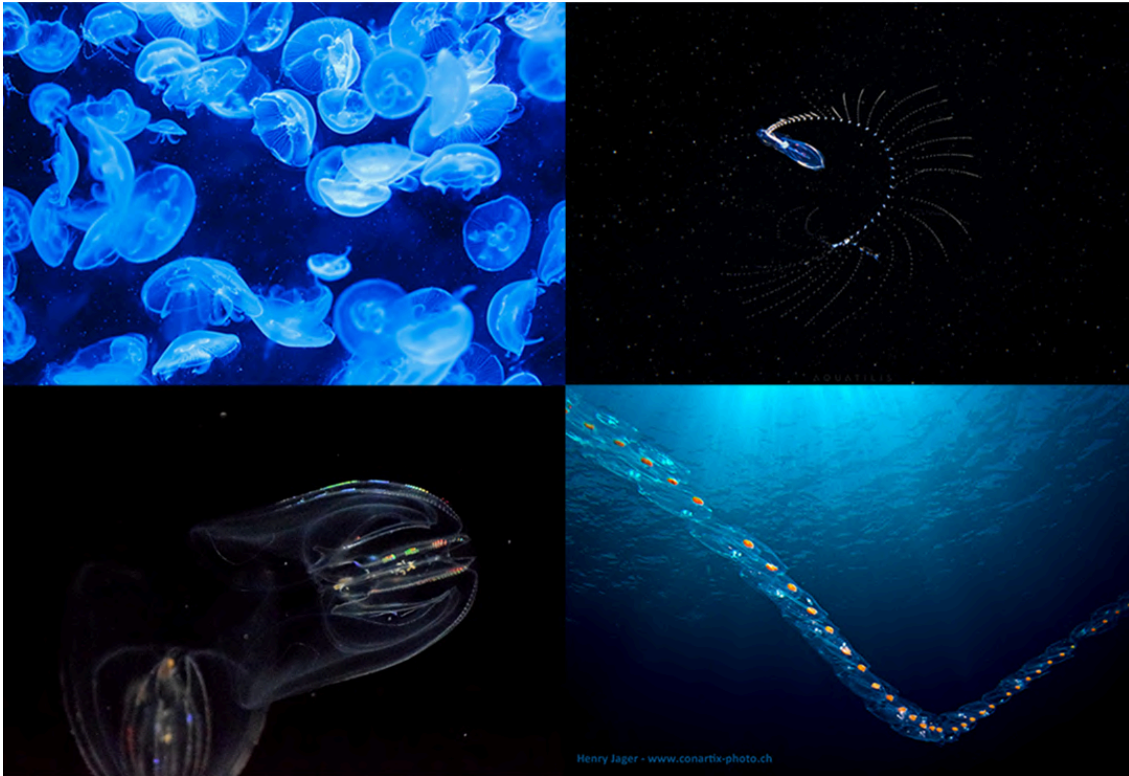


Image 2. Four main groups of jellyfish. Clockwise: medusae, siphonophora, ctenophora, and salps.

Jellyfish do not have a heart, gills, a brain, or bones. They all have a gelatinous body, one or more mouths and stomachs for food consumption, and four or eight gonads. Some rare instances of jellyfish are able to swim, yet most of them drift at the mercy of the currents. This feature is the reason why they fit so well with the definition of plankton, from Greek *πλανᾶω* (*planáō*), to "drift" or "wander"—they are quite literally the drifting wanderers.

Appearing so distant from our own physicalities, jellyfish could seem to be straight out of science fiction. The way most jellyfish reproduce is by clonal reproduction, which for many species starts after the hatching of a fertilized egg, in a cycle that is also called “alternation of generations” (Gershwin 2013, 172). Most jellyfish have a pelagic state where they become a floating and bouncy medusa able to reproduce sexually, and a benthic state, where they become a polyp that sticks to rock and reproduces asexually. Both forms are generally considered “adult forms” of the cycle, and that is what makes jellyfish reproduction so amazingly bizarre: when jellyfish lay eggs, what hatches is a polyp; when the polyp grows, it grows up to become a medusa. Because polyps reproduce asexually, they can clone themselves almost endlessly before



becoming sexually reproducing medusae. This unique process appears even more astonishing in the *Turritopsis dohrnii*, the Immortal Jellyfish. When this creature dies, its cells disassociate and the organism disintegrates. But, within just five days, those cells can reaggregate and go back to the stage of polyp, which will then grow again to become a medusa, generating a potentially endless reaggregation of the same body—this is the first instance of found biological immortality (Gershwin 2013, 179). With most jellyfish however, the only perennial state is the benthic one: the polyp. It is perennial because polyps reproduce asexually. Much like the name “benthic” suggests, the polyp lives attached to the bottom of the sea like its cousins coral and anemone. Polyps need a hard substrate to attach to in order to grow — they can be rocks, shells, or other hard surfaces. Once they find one, they can live for many years undisturbed (Vodopivec et al. 2021). Polyps are responsible for jellyfish blooms, the consequence of unlimited and unrestricted asexual reproduction that leads to huge groups of medusae swimming in enormous quantities (see Image 3). There are also species that do not have the polyp stage, such as ctenophora. Because ctenophora are hermaphrodites, they only have a pelagic state which reproduces asexually. Because of this, comb jellies can clone and grow at even faster rates than other jellyfish.



Image 3. Jellyfish bloom in Mar Menor. Stephanie Booth. 25 October 2012.

Jellyfish's eating habits almost always involve their venomous tentacles to catch the prey and drag it towards their mouth(s). In the case of comb jellies and salps, the prey ends up trapped in their sticky lashes which are not venomous. Jellyfish are carnivores and they feed on larvae, eggs, and other zooplankton but, needless to say, they are not picky. They can eat eggs and larvae of species that are above them in the trophic chain. In doing so, they simultaneously become competitors and predators of the same species, having drastic consequences on the ecosystems they live in. This technique is called the "double whammy" of jellyfish (Gershwin 2013, 182).

Another excellent survival skill jellyfish have is that they can thrive in every type of oceanic water. They are not much affected by salinity, acidity, or temperature variations. Jellyfish possess contractile cells, known as osmoregulatory cells or cnidocytes, that help maintain their internal salt balance despite changes in external salinity. Moreover, because they do not possess a bone structure and are mostly made of water, they are not affected by

pH variations. Higher temperatures allow them to reproduce sexually more often (Lamb 2017). Other species, both prey and predator of jellyfish, are affected by those same chemical variations. Because of this, jellyfish are often “the last man left standing” in Gershwin’s words: they eat everything they find and end up with no natural predators. Even if their food supplies run out, comb jellies will consume their own larvae, which will consist of up to 76 percent of their prey (Gershwin 2013, 51). Other jellyfish will resolve to eat their own body mass, decreasing their body size significantly without losing the capacity to reproduce sexually. Once they have access to food supplies again, they will grow back to their original size and keep taking advantage of their dual life cycle, but they will be many many more.

## **1.2 – Leaky more-than-human and slimy Ocean**

It is interesting, and quite ironic, that we label jellyfish as invasive species, yet it is human exploitative activities that displace them and offer them ideal conditions for thriving. To be fair, this is true for all animals classified as alien species. The Convention on Biological Diversity defines alien species “as plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health” (2010). The fact of the matter is that humans are similar to jellyfish in many aspects. In terms of utilizing environmental resources around us to grow and occupy every available space, we do not stop even if this behavior implies unsettling natural balances. And jellyfish are much more immune to the consequences of this than us. In fact, jellyfish have populated the Ocean long before humans, dating back to the Precambrian period, around 565 million years ago.

Their lifestyle has allowed them to have half a billion years and five mass extinctions behind them: not only is human action not a threat to them, it is even an incentive to a better life. Jellyfish’s adaptive skills are so detrimental to most other species that marine ecosystems everywhere are looking more and more like they used to during the Cambrian period. There is consensus among the global community of scientists that jellyfish “are reverting back to primeval seas of millions of years ago, when algae, bacteria and jellyfish ruled the oceans”

(Barboza and Weiss 2011). One of them is Jeremy Jackson at the Scripps Institution of Oceanography, who eerily dubbed this oceanic transformation the “Rise of Slime”. Let us now look closer at the slimy joint venture humans and jellyfish cocreate.

When talking about jellyfish and their polyps, the Feral Atlas identifies five main categories of thought that help make sense of this entanglement: creatures that “thrive with plantation condition”, “like human disturbance”, have “superpowers”, end up being “industrial stowaways”, and are “uncontainable”. Clearly, there are instances in which more than one category is applicable, because all the conditions are naturally dependent on the global routes of capitalism. All throughout the world, capital has imposed itself as the only imaginable system with rules aimed at the simplification and exploitation of ecology. But this infrastructural system has always had streaks of unpredictable feral consequences, as Tsing et al. (2021) remark: “The straight lines and bright grids of industrialization hide ever-spreading brownfields and their leaky toxic residue”. And jellyfish love to wander in those toxic leaks. Going through the categories from the Feral Atlas, I will show how jellyfish’s biology gives them much more disruptive agency in the more-than-human Ocean.

Let us dive into the first category, the plantation condition. Among the many names that Donna Haraway has discussed for the current epoch, the one that seems to be the most disturbingly close to jellyfish’s ways of living is *Plantationocene*. The Plantationocene began with plantation practices, where entire places of land started being devoted to the sole exploitation of space, water, resources, and non-human beings—notably plants and animals. Along the same lines of capital’s development, the plantation condition inevitably and dramatically worsened with globalization, because as the availability of space appeared to be endless, time shrunk. Haraway cites many “burdens” caused by plantations, namely “toxic chemistry, mining, depletion of lakes and rivers under and above ground, ecosystem simplification, vast genocides of people and other critters” (Haraway 2015, 159). Simultaneously, within this context, Tsing emphasizes the simplification of ecology under capital. She argues that the plantation structure deprives organisms of their essence of beings with their life worlds and turns them into resources. This process is done “to standardize and

maximize the speed of replication”, so that organisms only live with replicas of themselves (Tsing 2017, 59).

The plantation condition addressed in the Feral Atlas refers to our age’s industrial engineering, which has expanded from the structure of the plantation to new realms. It is leaving behind itself a heterogenous mass of what Tsing would call ghosts, generated through all the undesired and unpredicted consequences of the industry. Jellyfish, attracted by the “relentless waste” of “leaky sewers” do not sit still—by disrupting trophic chains everywhere, “they tell us about stretches of ancient time and contemporary layerings of time, collapsed together in landscapes” (Tsing et al. 2017, G8). Jellyfish thrive in the plantation condition in the sense that they can handle water alterations without difficulties: agricultural waste, or “matter out of place” (Douglas 1966 quoted in Eriksen 2016, 106), leaves traces on its way, and as the runoff of agricultural nitrogen and phosphorus reaches coastal waters, it pollutes the waters’ composition. Water becomes too hot, or too acidic, or too rich of chemicals for most fish to bear: this process is called eutrophication. When the water is too rich in nutrients, phytoplankton, algae and seaweed grow disproportionately. In doing so, they consume all the oxygen in the water when they photosynthesize. Most fish die of asphyxiation, but jellyfish can live in hypoxic waters, and even in anoxic ones (Gershwin 2013, 182-183)—with eutrophication, jellyfish multiply. Jellyfish can even make eutrophication worse, because they feed on zooplankton, so the phytoplankton population is left without natural predators, free to thrive. As fish population declines, and their eggs either cannot hatch for oxygen deprivation or get eaten by jellyfish, it does not take long for fish to disappear from the picture, leaving much room for slimy assemblies of algae and jellyfish.

The impact of eutrophication combined with overfishing and climate change contribute to the “rise of slime” that is lethal for the majority of species. Overfishing is one of the main causes of jellyfish blooms: remember the “double whammy” of jellyfish? Despite advancements in our methodologies and forecasting capabilities, ongoing issues of overfishing have resulted in a troubling reality, where overall yields have steadily declined since reaching their peak in 1994 (Worm et al. 2006, as quoted in Gershwin 2013, 128). According to

the United Nations Environmental Programme, as of 2002, 72% of the world's marine fish stocks were being depleted at a faster rate than they could replenish (UNEP 2004, 1 as quoted in Gershwin 2013, 128). This alarming trend presents a stark reality, with projections indicating the potential commercial extinction of all presently targeted species by the year 2048.

When we add climate change to the picture, the situation appears even grimmer. We are accelerating the warming of our atmosphere and Ocean at an unprecedented rate compared to the entire history of the Earth, which has lasted 4.5 billion years. This is resulting in the creation of a climate unlike anything human beings have previously encountered—a climate that may not align with our preferences. Many animal and plant species will face challenges in surviving, as they cannot adapt quickly enough to such rapid changes, leading to a restructuring of species within ecosystems. In this readjustment, jellyfish bloom undisturbed.

Another instance of jellyfish getting comfortable and gluttonous around humans is ocean sprawl, which refers to the expansion of infrastructure such as natural gas platforms, concrete coastlines, oil and gas rigs, shipping ports, and wind farms within marine environments. Jellyfish thrive with ocean sprawl because polyps need a hard surface to attach themselves to. So, once they can get their roots on any of these structures, they will colonize the place: ocean sprawl provides endless surface area for jellyfish to replicate in quantities much bigger than normal—generating huge jellyfish blooms—and to expand way further in the waters. In fact, even when they are threatened by unfavorable conditions such as high levels of predation, jellyfish take complete advantage of artificial rigs along concrete shorelines to replicate and replicate, so that no losses are felt. What is even more unfathomable to realize is that the sexually mature medusae are taken away by the currents, so it is virtually impossible to trace back where the original polyps came from—they could be miles away from them, and they cannot be kept at bay. So, even if the blooms in a certain area dissipate, it does not mean that medusae will not show up again very close at some point, sons and daughters growing from polyps that were attached to rigs far away (Vodopivec et al. 2021).

Jellyfish’s literal attachment to anthropogenic infrastructure is one of the factors that earned them the Feral Atlas title of “superpowers’ possessors”. Their altered behavior in response to environmental changes is defined as an accelerated evolutionary change, which “derives from strong natural selection exerted by human technology” (Palumbi 2001, 1786–1787). A notable example of this behavior is that of the moon jelly (*Aurelia Aurita*). See Figure 2 for astonishing data on the growth of its blooms in the Adriatic Sea. The moon jellyfish has taken advantage of the offshore platforms that started being built in the area through the 20th century (Vodopivec et al. 2021).

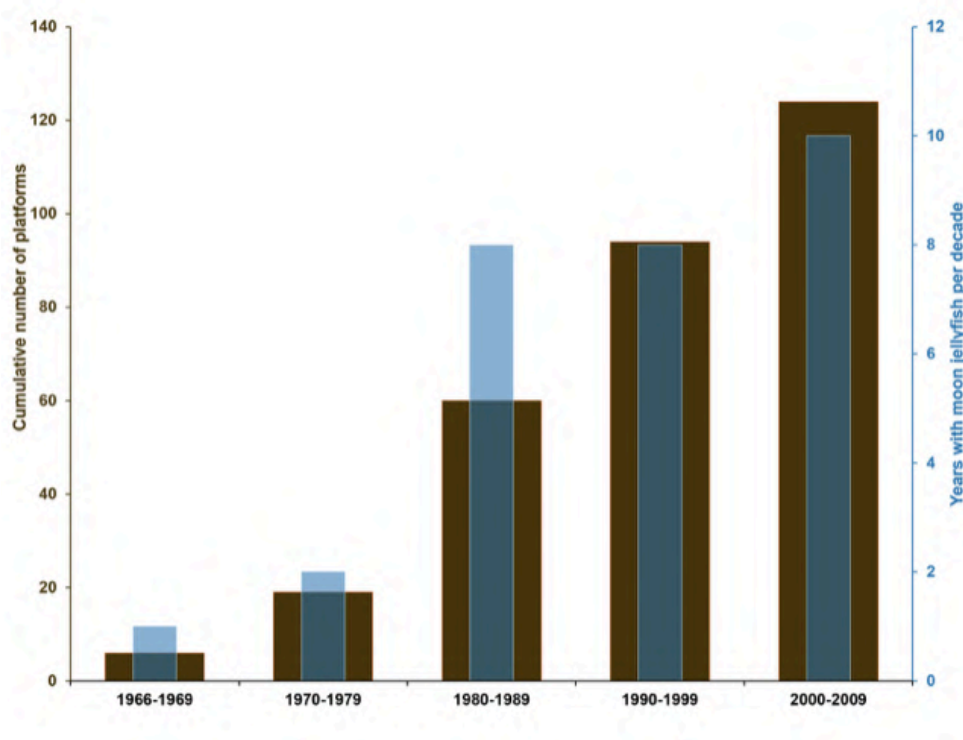


Figure 2. The moon jellyfish (*Aurelia aurita* s.l.) population rise in the Adriatic Sea from 1966 to 2009 corresponds to the rise of installed offshore platforms. (Vodopivec et al. 2021)

Naturally in that instance the polyps of moon jellyfish spread far through the Adriatic Sea: they reached “the ports of Koper [Slovenia], Trieste, Split, Ploče, [...] a shipwreck in the vicinity of Ancona, and [...] a gas-drilling offshore platform” (Vodopivec et al. 2021). It is interesting to notice that prior to these giant infrastructures, the local marine ecosystem was mainly composed of sand and mud. The significant lack of rocks in the area did not fulfill jellyfish

requirements. However, after the area started becoming subject to ocean sprawl, the criteria were met and polyps flooded. This is disturbing if we consider that “despite intense searches, to date not one [polyp] has been found in a natural environment” (Vodopivec et al. 2021).

Besides the plantation, there is another technology that is very dear to the heart of globalization, one that allows the ever-growing tentacles of the market to stretch endlessly: cargo ships. There is an incredible quantity of marine biodiversity that is scattered around the globe through the ballast waters of container ships. The Feral Atlas calls these creatures “industrial stowaways”. Of course, one of the most catastrophic instances in known history involves jellyfish. More specifically, the Ctenophore *Mnemiopsis leidyi*. Because comb jellies lack the polyp phase, they can reproduce even faster than their relatives. They are hermaphrodites and can fertilize themselves, they reproduce within thirteen days from their birth, they can (and will) have 10000 offspring individuals and eat up to three times their own body weight everyday (Gershwin 2021). Comb jellies were accidentally introduced into the Black Sea through ballast water in the 1980s. The drastic consequence of this has been that 95% of the biomass of the Black Sea was composed of the small comb jellies shortly after they were introduced, destroying the original biodiversity of the area and the fisheries that relied on mackerel. Shortly after, other alien species started blooming in the area, notably *Rhizostoma Pulmo* and *Aurelia Aurita*. The comb jelly population was later reduced by another species introduced again through ballast waters, called *Beroe*, which is its natural predator (Gershwin 2021). Because of this, fisheries slowly started returning, but they still struggled with the large presence of jellyfish and eutrophication.

Interestingly enough, by the time the Soviet Union collapsed, the subsidies for the fertilizers to the farmers around the Black Sea stopped, so the nutrients input to the Black Sea slowed down (Gershwin 2021). This allowed for the two comb jelly species to reduce, but in the meantime they started spreading all throughout the seas of Europe, reaching the Marmara Sea and the northern Aegean Seas in the early 1980s; then the Caspian Sea, and more recently up to the North and Baltic Seas (Fach et al. 2021). This quick expansion makes it easy to understand why the Feral Atlas labeled jellyfish as “uncontainable”.



On top of all this, jellyfish are responsible for other major issues. They cause health hazards with their stinging cells, which can be deadly. This issue clearly intensifies when jellyfish bloom, to the point that they damage tourism infrastructures all over the world from Australia, to Florida, the Philippines, Israel (Lee et al. 2022, 2; Richardson et al. 2009, 312; Tsing et al. 2017, M1). They damage coastal facilities, capsizing military boats (Tsing et al. 2017, M1) and clogging cooling fans, notably in electric and nuclear power plants around the US, Europe, and Asia (Farrier 2009, 95; Gershwin, 2013, see tables 1, 2, 3 from the Appendix). The huge ouroboros of gelatinous destruction has been called in different ways by researchers, notably the Jellyfish Joyride (Richardson et al. 2009) and the Jelly Web (Chi et al. 2020).

### **1.3 – A “gapped” relationship: history of mystery surrounding jellyfish**

By now, scientific literature on the matters of jellyfish has become widespread. This is of course a swim deeper, but it is not enough to look at the issues with the scientist's eyes: if we only observe the current physical reality, we will fail to “discern the ghosts of missing animals” from the past (Dayton et al. 1998 quoted in Gershwin 2013, 264). The shift in the landscape is so fast that the baseline of what is natural changes before we can be familiar with how it looks in the present. This issue is called the “shifting baseline theory”, so “simply” observing the current state of things will not prevent future generations from dealing with the trauma of loss.

Why do jellyfish not stop? We know they have a neural net but no brain. It is nearly impossible to biologically establish if they own any system of cognition at all, but we could probably exclude that they behave out of pure hubris. And yet, when one really looks at their astonishing skills of resilience and adaptation, it almost seems like they do. Jellyfish have become indicators that something in the water is unbalanced, and they always manage to exacerbate that unbalance. Often hated and dreaded for their fearful stinging tentacles, or seen as nauseating disrupting substances that are “filling the seas with sloshing goo” (Tsing et al. 2017, M1), jellyfish act as pests. There are many animals that act this way, like weeds, cockroaches, rats, crows, but jellyfish are masters at this

art (Gershwin 2014, 2021). Moreover, jellyfish are auto-rewilders: creatures that thrive where the others perish, they take up the space of less aggressive others preventing them from adapting, “they are weedy [...] [l]ike us, they do not play well with others [...] [t]hey help us make the Anthropocene, the proposed epoch of outsized human disturbance” (Tsing 2017, quoted in Lorimer 2022, 81). When jellyfish flourish and degenerate into ever-growing blooms in conditions that kill most other species, they “indicate that the oceans are increasingly inhospitable to the majority of marine life” (Farrier 2009, 95).

There are hypotheses to limit these jellyfish-pest-outbreaks but they are little to no effective. The reintroduction of predators is too risky for trophic balance and the reintroduced species should be safeguarded from poaching (Gershwin 2021). Another hypothesis is cuisine: jellyfish are a common delicacy throughout Asian cooking, so it could become a gourmet dish in the parts of the world that are not accustomed to eating them. Assuming we could overcome the cultural estrangement induced by the consumption of a jellyfish, it still would not be that simple because some jellyfish are not edible at all as they melt quickly out of the water. In general, they are hard to fish: if they are fished using nets, there will be an unnecessary killing of other unwanted species (Gershwin 2021). What to do, then? It is hard to answer this question, especially if we consider that if we take out all jellyfish from the entirety of the Ocean, we leave room for any other pest ready to take their place (Gershwin 2021).

We should try to make sense of the destruction we have in front of us – and deal with the grief. But why is it so hard still? Because jellyfish are ambivalent in their essence. Medusae are named after the Greek goddess Medusa as their shape recalls the greedy tentacles she has as hair. Much like that of the goddess, jellyfish’s dual nature is hard to grasp, it is uncanny, because it is fascinating and repellent all at once. We do not know if they anticipate what they want to do, if they feel pain, or if they plan things, or if they are able to communicate and cooperate. I personally think jellyfish do have some sort of cognition like every other being, but it is still “unlike anything we understand” (Gershwin 2021).

Visible, invisible,  
A fluctuating charm,  
An amber-colored amethyst  
Inhabits it; your arm  
Approaches, and  
It opens and  
It closes;  
You have meant  
To catch it,  
And it shrivels;  
You abandon  
Your intent—  
It opens, and it  
Closes and you  
Reach for it—  
The blue  
Surrounding it  
Grows cloudy, and  
It floats away  
From you. (Moore 1909, in Fach et al. 2021)

I find that the poem *A Jelly-Fish* by Marianne Moore depicts quite well the fleeting nature of the jellyfish. It articulates the frustration of being unable to connect with jellyfish through the approaches we normally use for other non-humans—we cannot communicate verbally, nor touch each other. For centuries, jellyfish stayed in the doom and gloom of the unknown. Jellyfish, much like their oceanic kin, have been shrouded in a historical veil of mystery. As centuries passed with minimal human interaction and understanding, leaving us with limited memories, except for the painful encounters with their stings.

Tsing argues that the anthropocentric ethic that characterizes our time makes “our categories and discriminations always produce zones of ‘boredom’ and unreadability” (Tsing 2004, 172). Indeed to us jellyfish are unreadable. Probably, we are to them too. In this context, when trying to relate to non-human animals, we find ourselves facing what Tsing calls “gaps”. She

defines gaps as “persistently uninteresting, invisible, and sometimes illegitimate zones” that are caused by our endless projects of categorization (Tsing 2004, 172). Encountering gaps means encountering “conceptual spaces and real places into which powerful demarcations do not travel well” (Tsing 2004, 175). There is a gap between us and Ocean inhabitants: “Ignoring multi-scale temporality has inherently obscured our understanding of ecosystem change and has thereby caused us to miss many forms of ecosystem agency for persistence through time” (Stopnitzky 2022). In front of what jellyfish are doing in the Ocean, we feel this gap-distortion, but we cannot process the grief it causes.

This gap is partially due to the fact that the science and technology used by researchers until the 20th century were inappropriate to study zooplankton. Biologists would wade in the shallows using massive dip nets or scoop jellyfish in buckets – essentially the technologies used to catch fish, which have bones. Jellyfish, unlike fish, ended up having their very light and delicate gelatinous tissue shredded by the nets; and once on boats, jellyfish would end up with bleach poured over to disarm the stingers (Berwald 2017, 23). This difficulty of sampling due to their fragility, combined with the cultural perception that jellyfish have long been considered a “nuisance [...] [and] [...] often cast as the villains of the sea, notorious for their sting” (Fritts 2020). This caused them to be severely understudied, and their ecosystems to be overlooked or simply misunderstood when they could have taught us so much about the state of our Ocean. Marine biology had become biased towards species that could bring profit to the fisheries market, it had become

[b]iased toward the animals that could withstand the nets and the bleach. It became the study of durable animals: fish, shrimp, crabs, lobsters, and shelled plankton. It wasn't until the 1970s that a few intrepid scientists realized that jellies and other fragile animals had been systematically overlooked for half a century. (Berwald 2017, 23)

With new practices of research, parallel findings sparked interest in the scientific community. One example of this is the recent discovery that jellyfish are exceptional carbon sinks. A 2020 study from the AGU journal *Global Biogeochemical Cycles* found that jellyfish alone could “increase estimates of the

total carbon that reaches the bottom of the ocean by 35%” (Fritts 2020). Moreover, Fritts writes that the “results suggest about 510 million metric tons of carbon are stored away in the ocean’s gelatinous zooplankton at any given time”. These numbers are remarkable. However, we do not grow fond of jellyfish simply because they are carbon sinks: gaps in the relationship still persist.

In 1997, while Gershwin was swimming in the ocean by Harbor Beach, Los Angeles, she saw a huge dark burgundy jellyfish: almost one square meter of circumference and three meters of tentacles. What is astonishing is that this huge jellyfish, swimming near the biggest biology institutions of the world (i.e., UCLA, USC, the Scripps Institution of Oceanography, and many other research institutions), was unknown. Gershwin and her team were the first ones classifying it, and they named it Black Sea Nettle (*Chrysaora achlyos*) for its coloring. This fact alone, Gershwin says, speaks volumes: “We have all our fantasies about space, but we are missing what is right in front of us” (Gershwin 2021). Another instance of the inscrutability that swims alongside jellyfish is the experience of filmmaker Isabelle Carbonell. In her article on the Feral Atlas, she tells the story of her quest to find and film jellyfish polyps. The whole piece is permeated with a sense of mystery around the difficulty she had in finding any local knowledge on jellyfish and their polyps. A fisherman who hosted her on their boat knew nothing of polyps despite their years-long research monitoring the effects of a regasification platform on marine life. Moreover, the marine biologist working at the aquarium in Koper, Slovenia, told the author she was not aware they had polyps in any of their saltwater tanks: they found them there by accident (Carbonell 2021).

#### **1.4 – Filling the “gap”: recognizing jellyfish’s duality and mourning**

The ambiguousness of jellyfish elicits two apparently contrasting feelings: we have seen dread and mystery on the one hand. But on the other hand, they are a source of attraction and curiosity. With the development of new technologies that allow humans to do research underwater (Berwald 2017, 23-24) and a newly developed interest for the aesthetic purposes of jellyfish in aquaria and photography (Hayward 2012; Alaimo 2013; O’Gorman 2018) jellyfish are

becoming more acknowledged in their beautiful colors and movements. Alaimo writes that “as struggles for ocean conservation gain momentum, the striking images of gelata (i.e. jellyfish) open up spaces for their recognition – as creatures, as beings, as life forms, if not as political subjects themselves” (Alaimo 2013, 155). Indeed, the aesthetic appreciation humans feel towards jellyfish need not be one that is necessarily objectifying through a fetishizing eye, on the contrary it can be one that is rooted in care (Puig De La Bellacasa, 2017) and ethics (Calarco, 2015). In this sense, the moving body of the jellyfish becomes an archetype for the more-than-human Ocean. In the water,

[m]ovement offers ways to engage, challenge, and face our contemporary moment where the larger movements of social, political, and planetary crises urgently need new thinking to resolve, but which overwhelm the scale of the human. (O’Gorman 2018)

Thinking through movement helps us navigate the different scales of the Anthropocene without attempting to find a balance, just floating and embodying fluidity. This concept is akin to Haraway’s theory of diffraction (Haraway quoted in Hayward 2012, 162, 181). In the physics of light, diffraction refers to the spreading out of light waves from the passage through a small opening or around a boundary. These patterns of interference are different from the wavelengths that produced them. Diffraction is the map of interference causing iridescence on the bodies of ctenophora. We can use diffraction in this context as a means to practice “situating the human and nonhuman in enfoldments that matter, a trope for ethics and history, an enactment of materiality as processional” (Hayward 2012, 162).

When Eva Hayward visited the Monterey Bay Aquarium, she vividly described her experience and the profound impact it had on her perception of jellyfish. As she wandered through the aquarium's exhibits, she became captivated by the plethora of metaphors interweaving jellyfish with extraterrestrial beings. With each pulsating movement and ethereal glow, these mesmerizing creatures seemed to transcend the boundaries of the familiar, evoking a sense of otherworldliness. The alien features of these “archetypal tentacular beings” (Farrier 2009, 95), such as their barnacles that embody

“interstitial sexes between [human] males and females” (Hayward 2012, 166) constitute bodies that to us are “antithetical to the relatable appeal of charismatic megafauna” (Jones 2019, 485), bodies that challenge our very notions of a body. The cognitive dissonance of this difference has caused what Jones (2019) calls “an antagonistic split in ocean ecocritical work” (485): jellyfish either become a beautiful object (Desmond 1999, quoted in Hayward 2012, 177; Alaimo 2013) functioning as a great specimen for posthuman ethics to build speculative life-worlds, or an uncanny enemy endowed with a destructive agency that worsens anthropogenic environmental degradation.

In the framework of multispecies justice (Heise 2016, quoted in Jones 2019, 486), jellyfish’s duality gets them a place in the middle of the natural-cultural continuum once again: jellyfish’s embodiment has a constructive force in our imagination and a simultaneous destructive ability in our factual world. Jellyfish “share with us histories [and] consequences” (Hayward 2012, 177), nevertheless the body difference between humans and jellyfish makes it nearly impossible for us to identify with them and ultimately to empathize with them, resulting in an identification that leads to “politics of erasure rather than empathy” (Hayward 2012, 177). This resentment seems to belong to Doctor Nesimi Ozan Veryeri when he speaks about the invasive species that took over the Marmara Sea in recent times (Gökalp 2022):

A common characteristic of invasive species is they don’t care. It’s just ‘me, me, me’. Invasive species have a high ego. [They] don’t care about the future, they only care about themselves.

Indeed, if a jellyfish can be appealing despite the difficulties at empathy we might experience, from a different angle in our sight and mind it will probably look uncannily appalling. Jellyfish blooms are one of the many unexpected and unintentional consequences of climate change, whose effects “will be not only terrifyingly destructive but also weird, uncomfortable, and unbearably gross” (Scatena, 2021).

However difficult it may be, I think we must learn to live with this duality. Duality is not necessarily divisive. We need to become emotionally educated to accept biological destruction. As is common with the complex matters of our

time, we find ourselves in between a clash of scales of time and space, and the ferality of jellyfish is very complex. Jellyfish's behaviors ought to be studied at the local level, but at the same time, most of their behaviors are partially reproducible, hence predictable, on a global scale. This clash in our "system-scale memory" (Stopnitzky, 2022) generates friction because it is hard to come to terms with the enormous network of causes and effects that has been generating this situation in the first place (Eriksen 2016, 29). Anthropogenic acceleration jointed with jellyfish tentacles might end up being what Eriksen defines as a runaway process, where the union of the two processes reinforces "growth processes which eventually lead to collapse", unless a "third instance" comes at play and changes the paradigm (Eriksen 2016, 21).

At the same time, this rapid pace is counteracted by a characteristic of this era known as slow violence, a form of violence described by Nixon (2013, quoted in Carbonell 2022) as taking place "gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (9). Between this constant shift of speed and slowness, extinction is taking place, because deep time adaptations of other forms of life are significantly outpaced by biodiversity loss. Extinction means death through different timescales, it is "the abrupt termination of a whole way of life, a mode of being that will never again be born or hatched into our world" (Rose et al. 2017, 9). There is not much we can learn from jellyfish in terms of adaptation: they do the same as we do—they expand. They subsume everything. But we can learn to become the "third instance" Eriksen recalled: from jellyfish we can learn to account for the impact of our actions.

According to Rose (2014), extinction is caused by "double death". Double death refers to a two-fold process of death that occurs when a species or ecosystem is destroyed. The first death is the physical loss of the species or ecosystem itself, while the second death entails the erasure of cultural knowledge, practices, and connections associated with that species or ecosystem (Rose 2014; Carbonell 2022). Jellyfish, with the cascading effects of their outstanding adaptation strategies, are leading towards the decline and



extinction of other species and ecosystems, representing the first death. The second death, in the case of jellyfish blooms, could be seen in the disruption of traditional fishing practices, cultural beliefs, and knowledge systems that indigenous and local communities have developed around specific species of fish and their environments. It could be seen in the shifting baselines syndrome as well. As jellyfish become more dominant, traditional ways of life that depend on the diversity and abundance of other species may be threatened or lost, leading to the cultural erasure associated with the second death.

In a healthy ecosystem, death binds beings. Without death, there is no life. Through mourning, we give meaning to death and make sense of its value in front of life. However, in a time of extinction, we are getting used to a different kind of death. As Rose writes (2014), double death “smashes the relationship between life and death, fracturing a compact that has been integral to life on Earth [throwing] the lives of Earth creatures into a barren place with no future and with a rapidly unraveling past”.

The way jellyfish blooms impact ecosystems and other life-forms can be compared to the “manufacture of corpses for food [...] sustained at the expense of hundreds of thousands of other lives” (Rose 2011, 28). For as speciesist as this may sound, we could use double death to recognize the cultural dimensions of ecological destruction, and to consequently appreciate the profound interdependencies between human cultures and the more-than-human. We could go back to the shared dimension of vulnerability in front of death, a vulnerability that can generate a death space where we stop being as cognitively detached—yet physically tightly entangled—from other living beings as we currently are. This cognitive shift can change the current paradigm of death as detached from life and stripped of meaning, and lead to a new cosmopolitical paradigm of connectivity.

If we do not strive to understand, but just look at reality for what it is and let the evoked feelings flow, we will create memories that are the key to recognition. Recognition as writer Amitav Ghosh intended, as “the passage from ignorance to knowledge [...] and to recognize is by no means to understand that which meets the eye; comprehension need play no part in a moment of recognition” (Ghosh 2016, 4-5). Even if we theoretically understand the

more-than-human Ocean, we cannot physically make sense of it because it is too vast and entangled. Anxiety and grief emerging from the destruction of our Ocean cannot be understood rationally, because emotions and feelings are the least rational features of humans. Death cannot be understood. To mourn is not to understand, to decipher rationally, but rather to recognize the evocative power of such a disaster. A moment of recognition “cannot disclose itself except in the presence of its lost other [moment]. The knowledge that results from recognition [...] arises rather from a renewed reckoning with a potentiality that lies within oneself” (Ghosh 2016, 5).

Doing so, and trying to acknowledge jellyfish as active agents within ecosystems, rather than passive objects of study, can be a way of accepting the duality Jones referred to (2009). This approach is what would ultimately be defined as ecological in the context of cosmopolitics, where ecology is:

[T]he study of the complex and uncertain interactions between more than just organisms and environments but, more generally, between any beings, and where interactions are never merely material but always involve value and the production of meaning. (Robbert and Mickey 2013, 3)

We have seen in this chapter that despite physically taking up all the space they inhabit, jellyfish are a good metaphor for the more-than-human Ocean. The metaphor leaves extensive room to discuss anthropogenic unpredicted impacts. Moving past a dualist cause-effect relationship framework, and using a symbiogenic approach that gives relevance to animal subjectivity and agency (Calarco, 2015, 5), I tried to show our ramifications with jellyfish, because the essence of the matter is ultimately relational. I flowed through jellyfish blooms and studied “contact zones where lines separating nature from culture have broken down” (Fuentes quoted in Kirksey and Helmreich 2010, 546).

The duality of these *monsters* is stingy, in the sense that it will come close to you, it will hurt you, and you will need quite some time for the pain to go away. It will sting your brain with memories of its graceful tentacles. Through their bodies jellyfish unveil the “wonders of symbiosis and the threats of ecological disruption” (Tsing et al. 2017, M2), in a way that resembles Kant’s awe-inducing sublime. The approach that divides a frightened gaze from a fascinated one

must be overcome adopting a cosmopolitical framework, one that acknowledges grief and traces “the multiplicity of associations between entities as they participate in a common, ecological collective—where nonhumans also have a voice in society” (Robbert and Mickey 2013, 1-2). In doing so, we can think diffractively and accept two opposing truths simultaneously: jellyfish as menaces and jellyfish as symbionts (Jones 2019, 499). We can be within the ever-flowing movement defining that jellyfish and humans “are deeply linked in ongoing nature-cultures” (Hayward 2012, 178).

## **Chapter 2 – Bathypelagic waters: sleeping with the fishes**

As we continue our exploration and transition towards the realm of marine slavery and climate colonialism, it is crucial to reflect on one particular theme we have dealt with in the previous chapter—the phenomenon of industrial stowaways. This phenomenon is widespread and nonexclusive to jellyfish, it includes a myriad of different species. Indeed, there are estimates of thousands of species being displaced every day in the “floating zoos and botanical gardens” of the shipping industry’s ballast water (Carlton and Geller 1993; NRC 1995; Carlton 2009, 39–40 quoted in Gershwin 2013, 218). A notable example is the introduction of foreign plankton into US waters, which averages around 2 million gallons every hour. One gallon measures 3.785 liters—if we do our math, we can somewhat envision that we are dealing with an incredible amount of water. A 1993 report by the US Congress Office of Technology Assessment (OTA) revealed that at least 4,542 species of foreign origin had established free-living populations in the United States, with the economic impact of just 79 of these species amounting to \$97 billion in damages by 1991. In fact, in the San Francisco Bay estuary alone, 234 exotic species have established populations, while an additional 125 species of obscure or uncertain origin contribute to ecological disruptions. This trend of introductions continues unabated, with a new species integrated into the San Francisco Bay ecosystem approximately every 14 weeks over the past 50 years (OTA 1993; Carlton 1995; Cohen and Carlton 1998, quoted in Gershwin 2013, 218).

These findings highlight the pervasive and ongoing challenges posed by species displacement in marine environments. However, displacement by sea does not happen only below the bottom of the ships, but above it as well: humans, and their goods, are displaced all the time. There is a stark contrast between non-human stowaways and human stowaways: the former navigate the oceans with a remarkable ability to thrive amidst displacement, but the latter face more violent, confusing, and abusive consequences. The UNFCCC defines adaptation as a set of “adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential

damages or to benefit from opportunities associated with climate change” (UNFCCC, 2013). Unlike plankton, most human stowaways are trapped in a cycle of suffering and marginalization, with their voyages forced by necessity often fraught with uncertainty and danger.

Thus, as we sink into bathypelagic waters, we delve into the intricate web of marine slavery and climate colonialism. Here, we are prompted to confront the grim realities of human displacement, climate migration, and the enduring legacy of exploitation in maritime spaces through container ships. We will reach deeper waters aboard an imaginary Medusa, named after the infamous French frigate that was shipwrecked in 1816. After the tragedy shook the souls of the nation, it took two years for painter Théodore Géricault to plan, study, and realize his masterpiece, *The Raft of the Medusa*. He immortalized the tragedy with the painting that became the very symbol Romanticism in his nation.

Akin to the enigmatic nature of the Greek deity Medusa, the history of the ship is as mysterious. I could not find a source that traced back why the ship was named Medusa. Maybe in an aesthetic fashion, as it was fierce and beautiful? Maybe in an apotropaic fashion, because it was powerful and could face hostility with its petrifying cannons? It is unclear, but what is clear is that Medusa is a name that carries a long legacy of symbology, and Géricault was no stranger to its evocative power. The myth of Medusa is plastic and ambivalent, and so are the bodies painted by Géricault, simultaneously so tragic and vibrant.

Our transoceanic journey aboard the Medusa will be a metaphorical vessel for exploration, inviting a reflection on the consequences of human drift in the more-than-human Ocean. Attached below the hull like a barnacle stuck to the wood, we will navigate bodies and the routes these “invisible” humans embark on; as the ship disaggregates and becomes a raft, we will sink deeper through forgotten goods and bodies.



Image 4. *The Raft of the Medusa*, Théodore Géricault, oil on canvas, 1818-1819, Louvre Museum.

## 2.1 – The meaning of shipwreck in Géricault’s painting

My primary source on the Medusa's tragic story, particularly the events surrounding the improvised raft and its aftermath, is the account provided by novelist Jonathan Miles in his book *The Wreck of the Medusa*, published in 2007. The French frigate *Méduse* (from here on referred to as Medusa) was a huge vessel endowed with 40 guns that launched in 1810. Its might and tonnage were part of the fleet that navigated the Ocean and fought during the Napoleonic Wars, especially in the Mauritius campaign of 1809–1811. The warship was involved in raids in the Caribbean as well.

A few years later however, after Napoleon’s demise and the beginning of the decline of his reborn French Empire, the Bourbon Restoration followed in 1816. It was then that Medusa was laid up and tasked with the transportation of French officials to Senegal to formally re-establish French occupation. Napoleon’s deeds had come to an end, but the colonized lands could not be lost in the process. The naval officer Hugues Duroy de Chaumareys was nominated captain of Medusa by the restored monarchy and aristocracy. It is fair to say

that he was picked solely because he had noble blood running through his family. This choice revealed itself to be fatal: in Miles' words, de Chaumareys was a “rusty relic from the ancien régime who had not put to sea for about a quarter of a century” (Miles 2007, 37). In fact, due to inept navigation by its captain, Medusa struck the Bank of Arguin off the coast of present-day Mauritania in the summer of 1816, resulting in the ship becoming a total loss.

Most of the 400 passengers evacuated, with 146 men and one woman forced onto an improvised raft towed by the frigate and its small fleet composed by the three ships *Loire*, *Argus*, and *Écho* (Miles, 2017). The towing proved impractical, leading to the boats abandoning the raft and its passengers in the open Ocean. The raft's occupants faced a dire situation, including storms, rebellions, and shortages of supplies. After 13 days at sea, the raft was discovered with only 15 people still alive.

After the shipwreck of the Medusa and the subsequent revelations of the disastrous events on the raft, there was a significant public and political reaction in France. The news of the tragedy stirred public emotion and became a major scandal. The incident exposed the incompetence and poor decision-making of captain de Chaumareys, and raised questions about the accountability of naval officers as well as distrust in the restored aristocratic regime. The survivors' accounts, notably the one written by Henri Savigny and Alexandre Corréard in their book *Naufrage de la frégate La Méduse* (French for *Shipwreck of the frigate Medusa*) published in 1817, played a crucial role in shaping public opinion. The book detailed the horrifying experiences on the raft, including acts of cannibalism, and criticized the actions of the captain and crew. This book was highly influential in shaping public opinion, to the point that Corréard was accused of incitement to rebellion and disobedience by the court (Miles, 2007, 192). The aftermath of the shipwreck led to a court-martial for captain de Chaumareys in 1817. While he was acquitted on some charges, he was found guilty of incompetent navigation and abandoning the ship prematurely. Although the lenient sentence sparked further public outrage, as many believed it was a whitewash, de Chaumareys did serve his sentence.

Now let us redirect our attention back to the victims of the shipwreck. Alone and terrified, the powerless bodies ended up trapped in a situation that was

worse than death itself. Cold, hunger, pain, exhaustion, thirst, violence, murder. The salty scars left by this shipwreck would never stop burning on their bodies. The people aboard the raft of the Medusa must have felt like the crew from Coleridge's poetic tale when they encountered the surreal plight of Life-in-Death: going through a sempiternal torture where one is neither alive nor dead. Faced with the stress of a shipwreck, a human body is infused with adrenaline. At first, the body will hold onto the raft for dear life, adrenaline will keep it awake for a while, as the waves pour themselves over in an endless motion. At some point though, the energy will run out. Fear might take its place, the bodies would succumb to panic and end their lives out of despair, with their own hands. They might lose hope, annihilated by terror, and let go of their hold, floating away with the water's embrace and ending up sleeping with the fishes. They might realize that what they want, out of everything that is crossing their minds, is to live: so they could start fighting with each other to consume the flesh of those that could not make it. They will endure and strive through the foul stench, pain, and grief of everything they lost.

Mentz (2020) writes that during Romanticism, the Ocean became the world. He argues that during this time the Ocean's dual natures of *Alien* and *Core* started swimming alongside each other. According to the Romantics, the Ocean "changed from horror into truth" (Mentz 2020, 77), and the body immersed in water appeared almost more ecstatic and revealing than frightening and dangerous. But these perspectives always clash and mix in times of shipwreck. We can clearly see that all these features live simultaneously on the bodies painted by Géricault.

Inside the catastrophe, bodies feel disorder on their skin. Tangible dislocation punctuates both the early modern globalizing process that wiped out so many human and nonhuman populations in the early modern period and our own era of warming oceans and killing storms. The sudden shock and pressure of immersion fractures ships, systems, and alliances. Human history has been enduring these disasters for a long time. Shipwreck [...] names the experience of multiple temporalities as clearly as anything. (Mentz 2015, xii)



The passengers of Medusa made their own choice to embark on their journey. Shipwrecks can be suspected in the back of the traveler's mind, but they cannot be predicted. The French delegation of Medusa left for Senegal looking to establish itself in a fertile land, where they could go to their resort and relish their servitude. People from Europe could deliberately displace themselves and change life settling in the South, taking all the resources they wanted and profiting out of human exploitation. Indeed, the voyage of the Medusa was oppressive in its essence: the more-than-human Ocean became the route to reach the land to exploit, the resources to extract, and the people to enslave. The cracked wood of the shipwreck lets light seep into the fragility and precariousness of this abusive and exploitative system and becomes a metaphor for it, where the more-than-human Ocean serves as both a conduit for commerce and a site of human suffering. The ship's passengers, including colonial administrators and military personnel appointed by French royals and aristocrats, were complicit in perpetuating the oppressive structures of the empire. Their journey and their shipwreck mirrored the broader patterns of European expansionism, characterized by the pursuit of wealth and power at the expense of indigenous peoples and ecosystems.

## **2.2 – Modernity: slavery and disease**

The merging process of *Alien* and *Core* in the Ocean started much earlier than Romanticism: the Ocean started becoming the world through trade and colonialism. Mentz (2020) calls this breakthrough phase the “premodern Anthropocene”, which was built both intentionally and unintentionally. From the end of the 1600s onwards, this hybrid world has been relying on and “is unimaginable without the structural movement and violence of the sea”. The 16th century marked the beginning of European powers' expansion into Africa, driven by the desire to exploit resources and establish economic control. This era saw the emergence of the transatlantic slave trade, where millions of Africans were forcibly taken from their homelands and transported across the ocean to work on plantations in the Americas, establishing the triangular trade.

Mentz's exploration of shipwreck as a metaphor for historical catastrophe resonates deeply in this context. He writes that shipwreck becomes an

“ecological parable” (2015, xx-xx): the violent disruptions caused by colonialism and the transatlantic slave trade shattered lives and ecosystems, leaving a legacy of trauma and destruction that reverberates through different time scales. By examining Medusa's ill-fated expedition within this broader historical framework, we can see the intertwined histories of human exploitation and environmental degradation that define the modern world as well as the contemporary world.

Shipwreck is indeed a more-than-human force in the more-than-human Ocean. Inside of it, there is a human bodily dimension of flesh that hangs there much like a figurehead of Medusa towering the bow of a ship with its hissing snakes and petrifying eyes. Writer Richard Younge gave flesh and bones to this more-than-human ship-assemblage in his broadsheet *The State of a Christian* in 1636. In it, the author “hurls human body parts, Christian souls, and nautical terms into a single crowded space”, in a more-than-human assemblage:

My Body is the Hull; the Keele my Back; my Neck the Stem; the Sides are my Ribbes; the Beames my Bones; my flesh the planks; Gristles and ligaments are the Pintells and knee-timbers; Arteries, veines and sinews the serverall seams of the Ship; my blood is the ballast; my heart the principall hold; my stomack the Cooke-roome; my Liver the Cesterne; my Bowels the sinke; my Lungs the Bellows; my teeth the Chopping-knives; except you divide them, and then they are the 32 points of the Sea-card both agreeing in number. (Younge 1636, quoted in Mentz 2015, 3)

This assemblage constitutes tonnes of sunken matter that keeps accumulating on the bottom of the Ocean. As far as we know, down there lie three million wrecks, for a total value of 30 billion dollars (Engar et al. 2022). Out of all the more-than-human white elephants that disaggregate in the depths, there is one that weighs the most: iron. In his writings, Glissant imagined the Ocean as a vast beginning, as *Core*, “collapsing in the end into the pleasures of sand, [...] but a beginning whose time is marked by those balls and chains gone green” (Mentz 2020, 7).

As much as the sea is history, as Derek Walcott wrote, Fred D’Aguiar reminds us that it is also slavery. It is *Alien*. For both authors, the Ocean “traces the fluid

connections between history and slavery” (Mentz 2020, 38). The forced displacement of enslaved and chained humans goes hand in hand with the displacement of nonhumans. The more-than-human Ocean is scattered with organic and inorganic components that found themselves down there involuntarily. Among those, and among the displaced nonhumans, there is not only plankton, but also much smaller microorganisms, such as viruses and bacteria, which are potential unintentional biological hazards. It was nothing short of a biological hazard that first started this pre-modern anthropocenic globalization during the naval quest to the “New World”. During that time, the biggest genocide in human history was carried out, totalizing between 50 and 76 million killed by disease. This process, and that of trade established later, left blood on their way, and these two forces were the violent bases of early globalization:

Any consideration of early modern wet globalization guides our attention inevitably toward the slave trade, as if drawn gravitationally by forces of cruelty and world-changing evil. The devastation and upheaval wrought by nonhuman agents during wet globalization, in particular the Afro-Eurasian diseases that devastated Native American humans whose bodies lacked antibodies to counter them, may have killed a larger number than did the slave trade—but the moral blindness of slaver and settler alike exposes the fundamental inhumanity that was the harbinger of early globalization. (Mentz 2020, 38)

The bodies aboard the slave ships were chained on the floor of the ship, subject to the same tortures of the shipwreck. A testimony of this is the autobiography of author Olaudah Equiano cited by Mentz (2020), who told the story of his time as a slave in trade. Equiano described the slave ship as a place of death and violence, a place where a potential crack in the ship’s wood was not necessary to make the scene look and feel just like the shipwreck of the Medusa. He wrote:

Imagine two hundred human beings crammed into a space barely capable of containing a third of them. Imagine vomit, naked flesh, swarming lice, the dead slumped, the dying crouched. (Equiano 1789, quoted in Mentz 2020, 109)

From this devastating perspective, my perception of the Ocean gets caught in the undertow, it shifts back and resembles more *Alien* than *Core*. Our idea of freedom today is chained to the dimension of slavery. As we have seen here, the bases of our contemporary globalized world were set in this premodern era, an era of violence, shipwreck, displacement, and disorientation. This stark contrast has shaped the entire process of civilization, one that grows on the ideal of freedom while weighing on the bodies of those who build it:

The cultural consequences of living inside this global system include a particular obsession with human liberty. As American historian Edmund Morgan has observed, ‘the growth of freedom experienced in the American Revolution depended more than we would like to admit on the enslavement of more than twenty percent of us at that time’. Morgan emphasizes [...] the ideological gymnastics required to justify a slave-holding nation that was dedicated to human liberty. The presence of enslaved people germinated an exaggerated and hypocritical ideology of freedom that still pervades the hybrid cultures of the New World. (Mentz 2020, 39-40)

### **2.3 – The contemporary I: constraint and forced migration**

Today, I feel that much has changed, and simultaneously I feel that nothing has. Our contemporary globalized world entails an unprecedented compression of time and space. However, while certain travelers, such as executives, expatriates, or tourists, are praised for their ability to bridge distances and link regions, others are viewed with concern for the same reason (Eriksen 2016, 60). The wood that was used to build slave ships is now transported in containers aboard colossal ships conducted by invisible seamen; cotton, tomatoes, cocoa and many more resources are still collected by migrants who are not protected. These people’s human rights are constantly denied.

Furthermore, we may imagine that bodies are not chained to ships anymore, but migrations today are forced nonetheless, out of climate change, poverty, disease. The routes migrants follow today are the routes of desperation, and they stem from the very routes of colonialism. The UNHCR reports that arrivals from Africa and Western Asia have been steadily increasing since 2020. In fact, combining the migrants traveling by land and by sea from 2020 to 2024, they

have risen from 95,666 in 2020, to 123,540 in 2021, to 160,070 in 2022, to 270,180 in 2023 (UNHCR 2024). Out of the tragically numerous events I remember from last year, the Cutro migrant shipwreck on February 26 2023 was one that really showed the atrocious state indifference when having to choose between saving people or letting them die. Smugglers and incompetent state forces do not face their sentence like captain de Chaumareys did: they do not even receive one. In Cutro, a boat carrying migrants sank while trying to land on the Calabrian coast as it was denied the help of the coast guard. The estimated passengers on the small boat were 200 people, almost entirely coming from Afghanistan, and the boat was leaving from Turkey towards western Europe. There were only 81 survivors.



Image 5. Remo Casilli, retrieved from InfoMigrants, 2023

The last update for migrants coming to Europe in 2024 was made on 28 January, stating that the migrants have been 11,801 so far. Out of them, 398 people entered Europe by land, all the others via sea. In 2024, the dead and missing are already 41—as I am writing on 4 February, it is almost one person a day since the beginning of the year. They might be even more considering the high chances of a body going missing in the water. From 2020 to 2024, out of



all the refugees and migrants arriving by sea to Italy, Greece, Spain, Cyprus and Malta, the dead and missing amount to the exorbitant number of 11,889 (UNHCR, 2024).



Image 6. Laurin Schmid, retrieved on X, 2018.

The migrants you see in Image 6, aboard a deflated raft, were rescued in 2018 by the NGO SOS Méditerranée, who brought them aboard the ship Aquarius. 83 people were saved, but two women could not make it, leaving their children orphans (@SOSMedFrance 2018). Do these people not look like the victims of the shipwreck of Medusa?

As I mentioned before, certain changes that are to be expected are not enacted. The fluidity of the devastating narrative of shipwreck does not stay in the water, it soaks the shores of strips of land. Chains, the representative symbol of slavery and physical detainment, are yet to be de facto abolished. In Libyan detainment camps for example, migrants are held in inhumane and degrading conditions that entail chains once again. One of the many victims of this is Salif Thioune, a Senegalese man who migrated to Italy during the COVID-19 pandemic of 2020. He shared his story with Valentina Maresca, a journalist who works for ANSA, partner of InfoMigrants. Since he came from a rural area of

Senegal, he wanted to come to Italy to study. Being that his passport is unfairly weak, he was forced to take the hard route of the Mediterranean migration, and managed to leave from Tunisia. As the boat was at sea, it was taken from Libyan smugglers, who then detained him and his friends as prisoners for ransom. He told the journalist that at the camp, the smugglers tied the migrants to walls, with chains. He saw friends get killed. After some time, Thioune managed to have his brother send the smugglers his ransom, because “the only important thing [for them] is to have people in order to profit off of them” (Thioune quoted in Maresca, 2023). To continue his excruciating journey, he was put to sea once again, even though he did not know how to swim. He managed to reach Italy, but all his friends died at sea. Senegal and shipwreck jointly reoccur.

Similar institutions present on land are the detention centers for repatriation (CPR in Italian). Handling migrants the same way Libyan smugglers do in detention camps, if not worse, these centers incarcerate the migrants that “make it to the other side”, erasing the possibility of building the life they escaped for. These periods of shut down are common in the lives of many contemporary migrants, and they are part of a systemic constraint that prevents migrants from moving freely and easily (Eriksen 2016, 77). The shipwreck of the contemporary never dries: it gets leaky.

In the introduction to the book *Blue Legalities* by Johnson and Braverman (2020), the authors cite Christina Sharpe’s book *In The Wake* from 2016. She refers to the word *wake* and its multiple meanings “to consider how past violence continues to resurface in the lives of African Americans today and how persistent forms of trauma and terror followed slave boats sailing across the Atlantic” (Braverman and Johnson 2020, 10). In the book, Sharpe goes on and includes other categories of contemporary slaves:

The semiotics of the slave ship continue: from the forced movements of the enslaved to the forced movements of the migrant and the refugee, to the regulation of Black people in North American streets and neighborhoods, to those ongoing crossings of and drownings in the Mediterranean Sea, to the brutal colonial reimaginings of the slave ship and the ark; to the reappearances of the slave ship in everyday life in the form of the prison, the camp, and the school. (Sharpe 2016, quoted in Braverman and Johnson 2020, 10).

Migration and asylum policies, along with legal frameworks, institutionalize and reinforce the trauma-inducing sea journeys undertaken by migrants. As ships and boats navigate across the Mediterranean and other maritime routes, Europe, the United States, and Australia, enact dehumanizing laws. Tragically, due to these policies “death tolls mount while the lives of survivors are displaced, suspended, and often made unlivable through detention and poverty” (Lyons 2018, quoted in Braverman and Johnson 2020, 11).

#### **2.4 – The contemporary II: “dissolved paper” and rectangular metallic boxes**

The policies that feed off of marine routes and contemporary forms of slavery could not be missing when addressing the biggest, most productive and most profitable technological infrastructure at the service of globalization: container ships. Almost a year ago, I read an extract on this topic from a compelling book. The article is a shortened and adapted version of the book by Rose George “Deep Sea and Foreign Going” (2013), and it was an extract from the Passenger’s guide of the Ocean by Iperborea. Shortly after, I retrieved the whole book and got inspired by it for this section of the chapter. Reading this piece once again allowed me to open my eyes to the drastic truth that our society is the Ocean and the Ocean is our society.

George engages her readers by telling them the story of a game she plays whenever she is on public transportation. She plays a game of numbers, where she tries to guess how many of the things people have on probably got there through an oceanic trip, aboard a container ship. The clothing they wear, the food they are eating, the beverages they are drinking, the metallic and electrical components of their appliances; the rocks and metals in their jewelry, the makeup on their faces. 90% of everything we own is shipped via the Ocean. The very container ship that delivered all those goods had probably been piloted throughout the Ocean by exploited workers, and that same ship had probably displaced more than one species of marine animals, plankton, and bacteria.

George goes on stating that since the 1970s, trade by sea has quadrupled and it does not seem to slow down its expansion. Furthermore, the size of the ships has significantly grown as well: measured in Teu (i.e. twenty-foot equivalent



unit, the most common length used to measure containers), the dimensions escalated from a capacity of 6400 Teu in 1996 to a 24000 Teu in 2021 (George, 2013). George, and I with her, wonder how ironic it is that as ships become bigger and bigger, we see them less and less, to the point that the space they occupy in our imagination disappears. This may be happening because these dimensions, as well as the global lengths these ships carry, are too big for us to make sense of them: “When it comes to global changes, we are [...] faced with concepts that are somewhat difficult to comprehend. These can be invisible, geographically or temporally distant, and it is then tempting to ignore them” (Dupont 2017, 1211). In the words of philosopher Timothy Morton (2013), they are hyperobjects.

Because we can't see to the end of them, hyperobjects are necessarily uncanny. Like the empty streets and open doorways in the paintings of Giorgio de Chirico [see Image 7], hyperobjects seem to beckon us further into themselves, making us realize that we're already lost inside them. The recognition of being caught in hyperobjects is precisely a feeling of strange familiarity and familiar strangeness. (Morton 2013, 55)



Image 7. Giorgio De Chirico, *Piazza d'Italia*, 1950-51 ca., oil on canvas, private collection.

To realize all these facets of oceanic global change, we need not to ignore them, but to find ways to make sense of them: to give them a body. But it is very difficult in the current global environment. It seems like the attitude of the general public towards containers and naval ports for container ships has strategically been turned to “out of sight and out of mind”. In our imagination, the human worker is expelled from the most crucial nexus of global capitalism: the port. The current fully automated technologies that are employed in global ports from Newark, to Rotterdam, to Shanghai have washed away the relationship between human workers and the Ocean, a relationship that lasted for centuries.

A bodily dimension for oceanic displacement we have examined in this chapter is that of shipwreck. For container ships too, the shipwreck is loss: “Ten thousand is the usual figure for the number of boxes lost at sea, [...] [but the] European Union calculates that 2000 containers are lost every year, that 15 per cent come ashore and that 15 per cent remain floating at sea, causing a serious hazard to small boats” (George 2013, 107). Container ships, and other ships as big as them, are causing significant environmental damage as well, becoming a health hazard for marine biodiversity and humans. Gershwin (2013, 188) writes that a 3,000-passenger cruise ship generates about 210,000 gallons of sewage in a week; in the same time, it produces 1,000,000 gallons of gray water (water filled with soaps and detergents); 37,000 gallons of oily bilge water; more than 8 tons of solid waste; tons of ballast water containing potential invasive species; and “toxic wastes from dry cleaning and photo-processing laboratories” (PEW 2003). Yet when dealing with matters of climate justice, this is mostly unheard of. Or at least, not the first thing that comes to mind.

All over the world, the number of seafarers working in cargo transportation on any kind of commercial ship is 1,89 million (Engar et al. 2022). Working on a cargo ship is nothing short of contemporary slavery. A cadet interviewed from South Africa’s *Sunday Times* reported that when they embarked on a ship they were told that the captain was their god who could “marry you, baptize you and even bury you without anybody’s permission” (George 2013, 18). She went on quoting her captain: “[T]he sea is no-man’s land and [...] what happens at sea, stays at sea”. Technically, it is true that the ocean is a no-man’s land. The United

Nations Convention on the Law of the Sea (UNCLOS) stipulated that each Nation-State has ruling rights over the 12 nautical miles from its coastline and over the 200 miles in its exclusive economic zone (EEZ). However, when law is written without taking into account the ontologies of the sea, the Ocean ends up being treated like land (Braverman and Johnson 2020, 14). Beyond these virtual and invisible limits, enter the inscrutable realm of international waters. There is endless jurisdiction for this area: the IMO (International Maritime Organization) is the UN agency that has passed more than most UN agencies on the matters that regulate ships, crews and safety (George 2013, 16). In addition to the IMO, there are the International Labour Organization (ILO), which looks out for the rights of seafarers, and the International Tribunal on Maritime Law for boundary disputes. However, despite all the legislation, the Ocean “dissolves paper”, especially when we are further away from the coast and deeper down in the water:

In practice, the [O]cean is still the world’s wildest place, both because of its fearsome natural danger and because of how easy it is out there to slip out of the boundaries of law and civilization that seem so firm ashore. (George 2013, 17).

Seafarers, unlike other workers involved in arduous work on land or migrants, do not have access to phone lines and the internet. They do not have union representatives, a police force, firefighters: they only have the Ocean. It is incredibly hard to communicate with seafarers, in fact their lawyers describe them as moving targets (George 2013, 18). Out of a ship crew, two-thirds have zero internet access, and only 12% have freely available internet access, but in any case cell phones mostly do not work. To me, being global should imply that the industry is under much more control, rule, administration, because of its global stakeholders, but it is precisely the other way around: out of sight, out of mind, from all points of view. Seafarers’ rights are constantly violated, in fact the ITF (International Transport Workers’ Federation) stated that in 2010 as well as 2009 they recovered £20 million of wages unpaid to seafarers who earned the money with their work at sea (George 2013, 18).

Out of the thousands of containers each worker encounters in their daily life, what is inside, the *contained*, is mostly unknown. Until it is involved in a story

of shipwreck, which unveils the hidden. In the context of container ships, these colossal vessels metaphorically embody pieces to cling to amidst shipwreck. Hidden under the tall shadows of the huge boxes, workers aboard these ships may perceive a semblance of safety as they work across the Ocean, in a way akin to the survivors of the Medusa desperately grasping at their makeshift raft. However, this illusion of safety is deceptive. Unlike the fate of the Medusa's captain, the perpetrators of exploitation and abuse aboard these modern vessels and those on land are those who take the most advantage out of them and evade accountability. This discrepancy highlights the ongoing injustices faced by those laboring at sea, where the specter of shipwreck looms large, both literally and figuratively. In fact containers, as does anything that is meant to contain, break. "From wombs to coffins, human bodies need containers" (Mentz 2020, 105)—we need a technological mediator to be in the water and to maintain globalization. What allows us to sail is the ship. What allows us to trade is the cargo ship. A ship is the body, the floating bubble that can cross the lines of trade on the endless expanse of overflowing water. The unpredictability and fluidity of the Ocean is akin to the conditions seafarers experience. Conrad's words depict the harsh reality of the ocean's indifference. This lack of protection mirrors the relentless vigilance required by workers at sea, where they face constant challenges without the safety nets afforded by society:

As if it were too great, too mighty for common virtues, the [O]cean has no compassion, no faith, no law, no memory. Its fickleness is to be held true to men's purposes only by an undaunted resolution and by a sleepless, armed, jealous vigilance, in which, perhaps, there has always been more hate than love. (Conrad in Mentz, 2020, 107)

If we think in these terms, the Ocean has become a colossal, dark, and terrifying container in the open—a coffin for all those who died and sunk to the bottom of the Ocean.

The shipwreck narrative of Medusa we embarked on in this chapter started in the modern age on a "death-pregnant hold of slaves" that was crossing the ocean, and it then transmuted into the "swelling white canvas" of a clipper ship, our Medusa (Mentz 2020, 111). As we have seen, these two apparently different

and contrasting component parts of the ship—one the symbol of constraint, one the symbol of freedom—are two faces of the same coin. The conception of the contemporary however looks much different: it is the rectangular metal container that has taken over both parts of the ship as a symbol of postmodern globalization. Containers carry migrants who hide and risk their lives as well as all those unsuspecting tools that will aggregate into smaller ships, the kind used to flee from crises, such as inflatable plastic, components, toxic paint, fans, and many more floating pieces. Today, “[c]ontainers carry the mercantile cargo that clipper ships once hauled, and they also smuggle human cargoes of refugees in a modern redistribution of the Middle Passage” (Mentz 2020, 111).

### Chapter 3 – Abyssopelagic waters: as cold as stone

Last year, during discussions about my thesis plan with my supervisor, he directed my attention to a particular plaque situated at Fondamenta San Sebastiano, Venice. This plaque quotes an excerpt from a letter written by the artist Amedeo Modigliani to one of his friends during his stay in the city (Bassi 2016, 172).

From Venice I received the most precious teachings in life; from Venice I appear to be leaving as more mature, like after a job. Venice, the head of Medusa with its infinite blue serpents, immense blue eye where the soul wanders and exalts amidst the infini... (Modigliani 1903-1905, translated by author)

When Modigliani was living in Venice, the city became his mirror: through the head of Medusa and all her blue eyed snakes which infinitely extended in a complex, watery, and entangled body, the painter could see wonder, so much so that he left his sentence unfinished in suspense.

As I have been living in Venice for almost two years now, Modigliani's metaphor resonates with my personal experience, and probably with that of many more like us. Venice is a maze: with some areas bright and spacious, reminiscent of the illuminated and rippled surface of shallow waters when they reflect sunlight; with most areas narrow, dark, crisp, slanted, tilted. Salt creeps into every wall, arch, and railing, pouring rusty metal on stone and cracking up matter. Venice is a head of stone above and below water, surrounded by fluid snakes: Modigliani avoided meeting her gaze directly, fearing that Medusa's stare would petrify him.

Nevertheless, it was Medusa who served as his guide, leading him through his explorations of the city. The complex network of shapes formed by Venice's snakes mirrors the surface of the deep sea floor made of plains, mountains, crevices, nooks and crannies and hydrothermal vents, salt, debris, metal, minerals, and stone. As we embark on our third chapter, we will engage with the mythological *monster* of Medusa, who will show us the truth. She will guide us through our descent in the cold and dark depths of the Ocean, through areas of the deep sea floor that have the same labyrinthine features of Venice. Through

her gaze of stone, she will let us see what is going on in the last frontier of extraction, “at the edge of space and time” (Childs 2020, 189).

### **3.1 – Descending into the abyss: meet Medusa**

Medusa’s name comes from the Greek Μέδουσα (Médūsa), the feminine present participle of the verb μέδω (médō), which means "to protect, rule over" (Etymonline, “Medusa”). Medusa is the protectress, the guardian. By extension, she is ruler or queen as well (Garber and Vickers 2003, 3). Medusa was born on the Greek island of Serifos as the only mortal offspring of the chthonic deities Phorcys and Keto, who live on the bottom of the Ocean. Medusa, one of the three Gorgons with her sisters Stheno and Euryale, was renowned for her beauty. This feature of hers became a curse when she encountered with the sea god Poseidon in the Temple of Athena, which led to her being raped by the god. As punishment for this transgression, Athena transformed Medusa into a monstrous figure, replacing her gorgeous locks with an entanglement of hissing snakes, and turning her stare into a petrifying malediction. Anyone who gazed upon Medusa would instantly turn to stone.

The Greek hero Perseus was then tasked by Zeus to kill Medusa. The Gods guided him through the deed, advising him not to look at her in the eyes. Hence he only looked at her through her reflection on his mirror, and managed to decapitate her. In this way, Perseus gained the most powerful of weapons: the head of a monster endowed with the petrifying gaze he used to petrify his enemies. This event was so emblematic in the myth of Perseus that even his constellation portrays him holding the beheaded head of Medusa, who has two stars as her petrifying eyes (see Lazarou and Liritzis 2022, 57). Perseus then gifted Medusa’s head to Athena, the goddess who punished Medusa for her beauty in the first place, who placed it at the center of her aegis to defeat her foes. As a consequence, “Medusa’s head thus becomes apotropaic, literally warding off or turning away the evils it embodies” (Garber and Vickers, 2003, 3).



Image 8. Sedrick Chisom, *Medusa wandered the Wetlands of the Capital Citadel Undisturbed by Two Confederate Drifters Preoccupied by Poisonous Vapors that Stirred in the Night Air*, 2021., Oil on canvas, courtesy of the artist and Pilar Corrias, London.

Throughout history, the figure of Medusa has been reinterpreted endless times, becoming the epitome of doubleness. In this painting by Sedrick Chisom for example (Image 8), Medusa appears as an undisturbed figure surrounded by a seemingly toxic mist that is unsettling the humans on the boat. They may have seen her, they may have found her attractive for her beauty and bearing, as well as scary because of her terrifying head of moving silver snakes. With a title that exalts the prophetic and calm attitude of Medusa in the face of a crisis that bothers humans, this painting brilliantly portrays how these two seemingly opposing dimensions coexist in the interpretation of Medusa to this day. The figure that was initially the embodiment of danger, competition, and sexual desire, then simultaneously transformed into a powerful talisman that warded off evil:



At once monster and beauty, disease and cure, threat and protection, poison and remedy, the woman with snaky locks who could turn the unwary onlooker to stone has come to stand for all that is obdurate and irresistible. (Garber and Vickers, 2003, 1)

Alone underwater, Medusa might not even notice the Ocean around her, which is so big it swallows her whole, just like a hyperobject. But as she looks around, she would see the truth she is immersed in. In fact, although petrifying, Medusa's gaze is metaphorically eye opening. When she gazes upon other beings, they look back at her. Alone underwater, Medusa might encounter deeply sunken internet cables reminding her of her hair, mollusks attached to them, glitches and fragments of rafts, of ball chains, of jellyfish carcasses, siphonophora. She could run into barnacles, which evoke in her memories of petrified eyes, teeth, bones, and other stony body parts.



Image 9. Sonika Agarwal, Close-up of barnacles on the rocks at the sea shore during low tide in Mumbai, India, Unsplash, 2023.

Medusa's dual stare will be a metaphor for the current deep sea explorations. Beautiful and delicate habitats and biodiversity are petrified and immobilized,

isolated in time and places as pieces of resources that are disposable and ready to be extracted. This is the stony truth the Ocean floor is facing today, and in order to make sense of it, we need to look in the eyes of its truth. In the contemporary turmoil of acceleration, Medusa, daughter of deep oceanic parents, has forgotten her Chthonic roots. Her eyes see the truth, but by seeing it she petrifies it. Her gaze is what allows her to see the world, but prevents her from interacting with it. Yet, stones can be turned around in one's hands. The word "chthonic" comes from the Greek  $\chi\theta\omicron\nu\iota\omicron\zeta$  (khthonios), derivative of khthōn, "earth", and refers to those who live beneath the earth and the Ocean. Chthonic beings are ambivalent, both ancient and contemporary. Endowed with all sorts of tentacles, they thrive in the diverse life of the earth and the water, but have no interest in focusing on the sky. Chthonic ones embody the essence of *monsters*, those able to show the truth, giving value to the tangible, earthly processes and life forms. Much like Medusa, chthonians create and destroy, are shaped and reshaped, simply existing as they are (Haraway 2016, 2).

### **3.2 – Sinking deeper: whirling around polymetallic nodules and other deep sea resources**

As humans, we see the time that passed between Perseus' murder and us today as a large abyss, and see that the stone has not remained unchanged. In humans' eyes, "the deep geological time of mineral formation is captured only at its very moment of becoming circumscribed as a resource" (Childs 2020, 192). Let us distance ourselves from Perseus, and think and feel like Medusa. Unlike humans, the Ocean knows, time is much longer, and Medusa too knows all about the process of sedimentation. Rocks come together on the ocean floor. Down here, nodules develop through the accumulation of various minerals collected from sediment pore waters (diagenetic) and cold seawaters (hydrogenetic), forming new structures and beddings for community life. These ecological niches hosted by the nodules are extremely delicate because rock formation is inordinately slow: they grow in size by approximately ten millimeters every million years.

The polymetallic rock nodules found on the bottom of the Ocean, as well as the other deep sea resources, are chthonians. In the depths they inhabit live chemosynthetic organisms that feed at hydrothermal vents, and detritivores, who are dependent on the tiny remains of resources that sink down from above. Uncaring of human made borders, organisms that live at the bottom of the Ocean freely move and navigate the water and the sea-floor. Xenophyophores, brittle stars, crustaceans, mollusks, and echinoderms with their "hedgehog-like" exteriors inhabit these environments, interacting with each other and with the substances found in the abyssal regions. Starfish and sea cucumbers consume various forms of Xenophyophores prevalent on the abyssal plains, with most of them living as surface-dwelling epifauna on the seabed, although some are known to exist as infauna, buried deep within the sediment. Down here, relationships of tight kinship are enacted. Polymetallic nodules not only provide habitat for marine organisms but also facilitate their existence by sharing mineral resources. For instance, Xenophyophores are formed using the same mineral-rich solution found in deep-ocean waters that supports the formation of the very manganese nodules. This mutual reliance on mineral resources blurs the distinction between what is traditionally considered nonliving or living resources, thickening the boundaries between mineral and biological entities. Our categories of sense are hard to apply in the chthonian realm of the abyss. "Nodules are lifeways in progress in the deep time of abyssal worlds" (Reid 2022, 78).



Image 10. Hohonu Moana, A field of manganese nodules in the deep waters next to Hawaii, NOAA Office of Ocean Exploration and Research, 2015.

Polymetallic nodules (PN) are not the sole deep sea resource present on the deep sea bottom. Other kinds of elements present on the rocky shores of the abyss are seafloor massive polymetallic sulfides (SMS) and cobalt-rich crusts (CRC). As you can see in Table 1, they are very different in features. Polymetallic nodules are mostly constituted of manganese, iron, cobalt, copper, nickel, and rare earth elements. Usually found between depths of 4500 and 5500 meters, they are hard to collect, but many explorations are taking place in the area where they are the most concentrated, the Clarion Clipperton Zone (CCZ) which we will navigate more in depth later. Their size can vary from 5 mm to 10 cm and they take the longest time to form. Almost as slow, there are CRC, which aggregate around 2-6 mm per million years. They are normally found on the summits of seamounts, hence difficult to collect. They appear as aggregates that cover rocks in very thin layers, between 1 and 260 mm of thickness, and they are generally located in the EEZs of the South Pacific islands, mostly at depths between 1000 and 3000 meters. Finally, there are SMS, whose features significantly differ from those of PN and CRC: they form around hydrothermal vents at a very fast rate, around one or two days. The metals that form their bodies are mainly copper, zinc, gold, and silver. These sulfides can be found



globally at shallower depths compared to the nodules, between 1400 and 3700 meters.

Important factors	Geological description	Deposit type		
		Polymetallic sulphides (SMS)	Polymetallic nodules (PN)	Cobalt-rich crusts (CRC)
		<ul style="list-style-type: none"> <li>Formed at boundaries of tectonic plates through interaction of 400°C magma and seawater.</li> <li>Mineral-rich fluid discharged through hydrothermal vents (active and inactive).</li> </ul>	<ul style="list-style-type: none"> <li>Found on abyssal plains of oceans</li> <li>Minerals form into potato-sized shapes (5 mm to 10 cm in diameter)</li> </ul>	<ul style="list-style-type: none"> <li>Forms metal-rich crust on flanks and summits of seamounts</li> <li>Often situated in areas that are very steep</li> </ul>
	Speed of geological formation	<ul style="list-style-type: none"> <li>Precipitation of sulphides leads to 'chimney' formation. Very rapid growth and re-growth (following collapse or mining) – up to 1 ft in 2 days (Gwyther and Wright 2008).</li> </ul>	<ul style="list-style-type: none"> <li>Form very slowly (about 1 inch per million years)</li> </ul>	<ul style="list-style-type: none"> <li>Thickness of crust varies (1–260 mm) depending on age of seamount but 2–6 mm per million years (ISA 2017)</li> </ul>
	Major associated metals	<ul style="list-style-type: none"> <li>Copper, zinc, gold and silver.</li> </ul>	<ul style="list-style-type: none"> <li>Manganese, iron, cobalt, copper, nickel, rare earth elements</li> </ul>	<ul style="list-style-type: none"> <li>Cobalt, also iron, manganese, nickel, platinum, etc.</li> </ul>
	Depth (m)	<ul style="list-style-type: none"> <li>400–4100, majority between 1400 and 3700 (Boschen et al. 2013).</li> </ul>	<ul style="list-style-type: none"> <li>3000–6000, mostly 4500–5500</li> </ul>	<ul style="list-style-type: none"> <li>400–7000, mostly 1000–3000</li> </ul>
	Global distribution	<ul style="list-style-type: none"> <li>Found globally, usually along mid-ocean ridges.</li> <li>Type of deposit found at Solwara 1, Papua New Guinea (world's first commercial extraction site).</li> </ul>	<ul style="list-style-type: none"> <li>Usually outside of EEZ</li> <li>Greatest concentration in Clarion Clipperton Zone, an area off the West coast of Mexico, 80% size of the contiguous states of USA (Wedding et al. 2015, 144)</li> </ul>	<ul style="list-style-type: none"> <li>Often in EEZs of island states of the South Pacific</li> <li>Over 11,000 seamounts in the Pacific Ocean alone (Yesson et al. 2011)</li> </ul>

Table 1. Types of deep sea mining and some selected characteristics, John Childs, 2020.

Seeing the long lasting impacts of our extractive practices, we know that the most drastic and long term consequences of anthropogenic extractive actions are unpredicted and unpredictable, or simply ignored despite the predictions. The fragility of the deep sea ecosystem should signal our way with red rays: deep sea resources should be left on the bottom of the Ocean. In Luís Vaz de Camões' epic poem *The Lusians* from 1572, the author narrated Vasco da

Gama's voyage and gave a voice to the rocky titan Adamastor, Africa's southern cape. Reflecting the times of navigation of "Europe's oceanic turn" (Mentz 2020, 47), the poem recounted Adamastor's attempts to warn the Portuguese fleet for their hybris:

Because you have desecrated nature's  
Secrets and the mysteries of the deep  
Hear from me now what retribution  
Fate proscribes for your insolence. (de Camões 1572 quoted in Mentz 2020, 49)

When we find a natural border, we are not supposed to cross it. What is hidden is supposed to stay hidden. Maybe it can be observed, but it should not be extracted. During our exploration, we have seen thus far that the Ocean has been seen as a dump by humans for a long time: the hiding place for unwanted matter, or the collateral victim to capitalist consumption, the Ocean has been filled to the brim with anthropogenic waste. At the same time, there is another label we attach to the Ocean, one that is as tightly connected to capitalism as the previous one: we see the Ocean as an extractive site. Indeed, extraction falls into the paradigmatic structure of capitalism, which is a "way of organizing nature" (Moore 2015 quoted in Bloomfield 2015, 505). From this perspective, the bottom of the Ocean is considered part of the same Nature that we want to subjugate, leading back to the Plantationocene:

Nature 'appears inert: ready to be dismembered and packaged for export' (Tsing 2003, 5100) – or as a 'commodity frontier' where 'further expansion is possible so long as there remains un-commodified land [...] "beyond"'. (Moore 2000 quoted in Childs 2020, 190)

### **3.3 – Is deep sea mining a suicidal mission?**

The industry of commercial Deep Sea Mining (DSM) aims to extract deep sea resources to employ them in the hi-tech industry, notably for the production of batteries and the components of other renewable energy sources like windmill blades and solar panels. The biggest area that has been so far pinpointed and targeted is the Clarion Clipperton Zone (CCZ), a vast region of nine million

square kilometers in the Eastern Pacific seabed, which is rich in polymetallic nodule fields (see Figure 3).

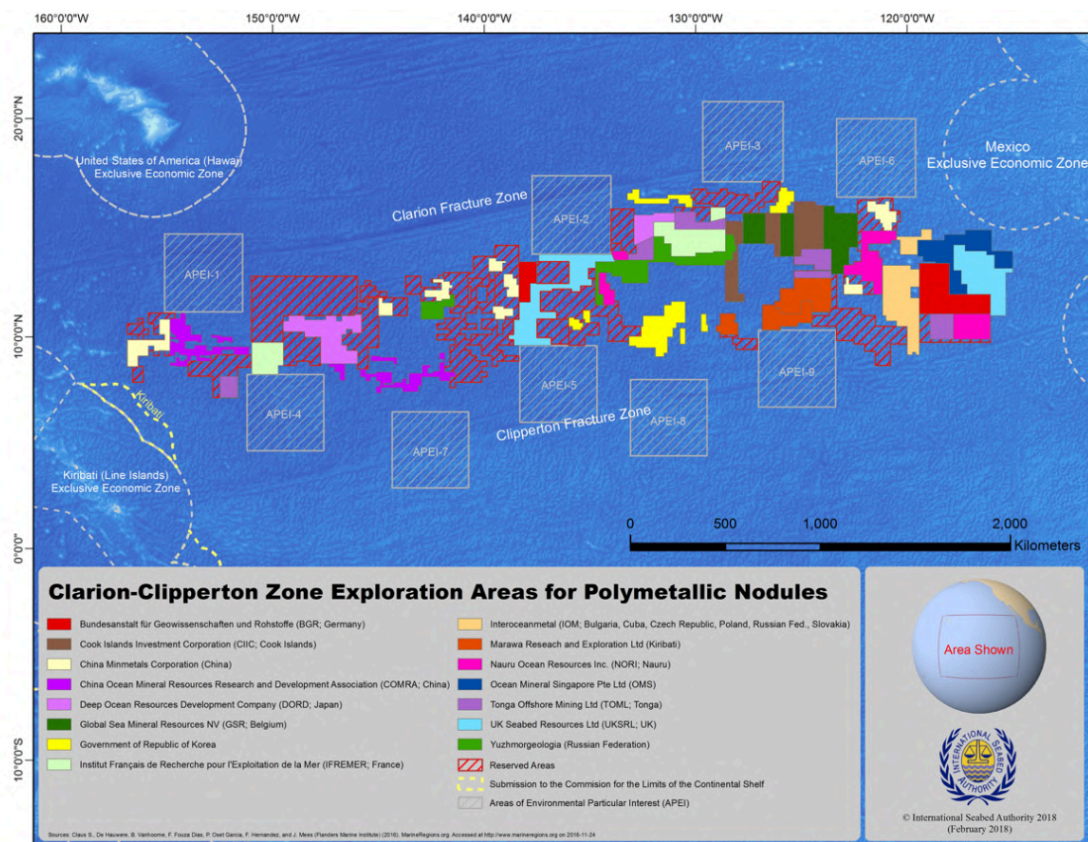


Figure 3. A map of the Clarion Clipperton Zone in the central Pacific Ocean, between Papua New Guinea and Mexico. The colored areas are licensed for mining, the shaded squares are currently protected from mining. Image adapted from the International Seabed Authority, Susan Reid, 2022.

These nodule fields, including those within the CCZ, harbor the varied ecosystems described above, where the deep sea organisms inhabiting the CCZ are particularly susceptible to disturbances due to their slow growth rates, late maturation, long lifespans, and limited or unpredictable reproduction. The continuous mining activities in this area are anticipated to have severe and enduring impacts, extending far beyond the timescales relevant to human observation. These practices would lead to a process of double death, as life would have no time to regenerate. In fact, extraction activities occurring relatively briefly on the deep sea floor may have short-term effects, but the long-term consequences on Earth's systems, the dispersion of sediment plumes in the Ocean, and the impacts on ecosystems that cannot physically be studied are likely to intensify the existing opposition to (DSM).

One existing instance of this is Blue Peril. In an attempt to effectively communicate these impacts in a language that we can understand somewhat better, the Blue Peril campaign (2022) created a visual investigation presenting a scientifically backed and accurate as well as gloomy picture of the far-reaching impacts of deep sea mining for Pacific Island communities. They focused on Nori-D, one of Nauru's four contract areas, which was supposed to be mined by the Canadian deep sea mining exploration company The Metals Company (TMC) starting from 2024. For the campaign, the authors used publicly available engineering estimates to simulate TMC's mining footprint. In the simulation, they incorporated full scale nodule collectors, which are far larger than industry prototypes. Assuming the nodule collectors would be operating 24/7, one day of mining should destroy 2 km<sup>2</sup>. Over one month, approximately 40 km<sup>2</sup>, and in one year an area between 400 and 600 km<sup>2</sup> would disappear.

Nevertheless, advocates for the DSM industry argue that seabed mining would bring economic benefits to countries in the global South, presenting their extractive endeavors under terms like "blue economy" or "blue capital" in an attempt to portray seabed mining as inherently harmless. Embracing the agenda of blue capitalism, the International Seabed Authority (ISA), tasked with regulating seabed exploitation, asserts that seabed mining could enhance the resource capacity of Pacific Island nations and foster the development of their "sustainable Blue Economy" (Reid 2022, 72). Supporters of mining also contend that mining the deep seabed is essential for obtaining minerals needed for humanity's transition to renewable energy sources.

However, a 2016 report from the Institute for Sustainable Futures challenges this perspective, suggesting that current renewable energy markets do not heavily rely on seabed minerals. Even under the most ambitious energy scenarios and increased demand, the report indicates that a shift to 100% renewable energy can be achieved without resorting to deep sea mining (Reid 2022, 72). In alignment with this critical stance and strong on the growing public opposition to seabed mining, which stemmed from the critique that the environmental and social impacts of mining have made the peoples of the global South poorer than richer (Ilolahia 2019, quoted in Reid 2022, 72), major corporations like Google, BMW, and Volvo have recently committed to abstain



from using seabed minerals and have publicly distanced themselves from the industry.

Unfortunately, despite the moratorium being accepted and shared by many international stakeholders, the proceedings of these operations do not seem to have stopped nonetheless. The biggest issue at play here is that the Ocean floor, the biggest and most unexplored body on our planet, is being conceived as a piece of land. Ignoring all the unique features of water, of depth, darkness, and biodiversity, the industry of DSM is using the rhetoric of necessity to justify economic interest. It is doing what every extractive industry has ever done in the history of humanity.

Deriving from this extractive narrative of necessity is the United Nations Convention on the Law of the Sea (UNCLOS). In particular, article 136 introduces a key principle that results useful in the current time of deep seabed extraction: the area beyond each State's EEZ and its resources "are the common heritage of mankind" (UNCLOS 1982, quoted in Childs 2020, 198). Following this definition, the Area identified by UNCLOS entails not only water, but also the sea-bed and Ocean floor, as well as the chthonian subsoil, all beyond the limits of national jurisdiction. Furthermore, the resources in question are "all solid, liquid or gaseous mineral resources in situ in the Area at or beneath the sea-bed, including polymetallic nodules" (UNCLOS 1982, quoted in Childs 2020, 198).

This anthropocentric, supply-depot approach forecloses relations of ethical responsibility toward the oceans (sic) themselves, as well as the living and nonliving entities that depend on them. (Reid 2022, 73)

This kind of assumption is shared among many actors that are part of the international network of policy makers and institutional bodies assigned to the protection, control and regulation of the Ocean. In Figure 4, we can see the complex and fragmented current landscape. Moreover, we can visualize the plurality of knots tied to the central knot of UNCLOS, implying many of these institutions share the same approach where they treat the Ocean and the sea-bed as if they were land on earth.

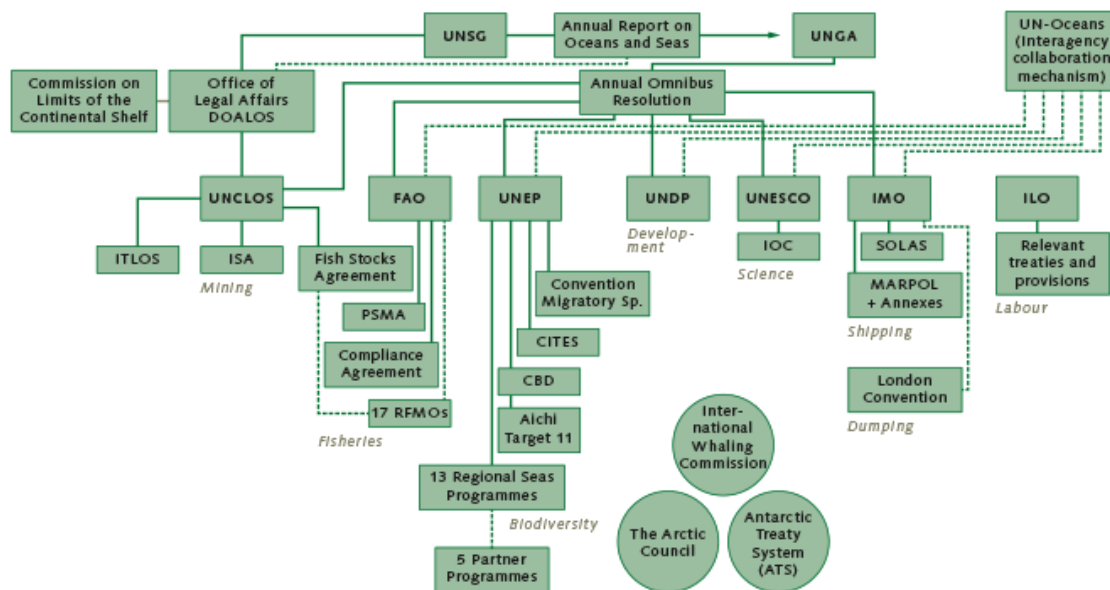


Figure 4. Ocean governance in a wide arena. Global Ocean Commission. 2020.

### 3.4 – “Thinking with the sessile ones”

All in all, despite the difficulties in regulating the Ocean and its resources in the fragmented and complex political and geological environment, it is impossible to not consider deep sea resources as geopolitical forces. Indeed, in the geopolitics of deep sea mineral resources, which means politics that take into account the interests of the Nation-State as well as the geomorphology of the Ocean floor, deep sea resources “‘become’ political by being ‘constitutive of and constituted within arrangements of substances, technologies, discourses, and the practices deployed by different kinds of actors’ (Richardson and Weszkalnys 2014, 16)” (Childs 2020, 191). We will see in the future how these different bodies will act, and if the extirpation of Oceanic ecosystems will actually take place, leaving plains of ghosts behind. Today, an international and globalized world will be the first community that regulates the deep sea bed. We will see if society will go on treating the sea bed as if it were land. We will see how it will approach it in relation to the Nation-State sovereignty. We will see if society will address the inherently concealed nature of the deep sea, and these decisions will significantly influence the politics surrounding it.

We have seen how delicate and complex the discussion around deep sea resources extraction is. This practice entails elements of slow violence for its

widespread and unseen disruptive impacts, while simultaneously being absolutely not forward-looking: the colossal time difference that occurs between the formation of different deep sea resources lacks in the equation (Childs 2020). As we have seen in chapter 1, this clash of scale and time is the cause of double death. The necessity for a change in this vision is what Susan Reid (2020) addresses when she writes that we should think with the sessile ones, the ones that are biologically classified as immobile but that in reality move ever so slowly. We should think like Medusa and her chthonian companions.

Thinking ecologically with the deep ocean and its long, slow-time relationships requires, as Code (2006) noted, placing time into our observations and responses. Astrida Neimanis and Rachel Loen Walker conceptualize such a watery slow time, inflected with generative, transcorporeal materiality, as “thick time” (2014). At benthic and abyssal depths, ocean waters transition in such thick time, very slowly but generatively. [...] Thinking with the seafloor calls for meditations on slow formation transitions at the edge of stillness: thinking with the sessile ones. (41)

The urgency of the numerous crises we confront can sometimes obscure the fact that it is precisely this way of thinking oriented towards urgent and unsustainable growth that has led us to this point. Our potential for success lies in engaging in deliberate, gradual, and thorough work.

The fluidity and movement of water should be influential in changing the current approach: the Ocean should be addressed as both a tangible and narrative geopolitical entity, underscoring the importance of its spatial and temporal aspects. Rather than a two-dimensional expanse, the sea has depth, layers, and volume, which significantly influence the dynamics of power and the types of political authority that may arise. New considerations of the deep sea might fit more accurately with the UNCLOS definition of common heritage. In this regard, Han (2019) proposes a definition that includes common responsibility as well:

We must embrace a more capacious notion of common heritage that also includes common responsibility. It is not just corals that define the material ways in which this seabed archive lives and changes. Trawling, imaging, cutting, and pumping operations transform ecosystems to create mud and shifting sands from rock, adding new sedimentary layers to landscapes. [...] We must look to a living archive, rather than a static one. (Han 2019, 480-481)

## **Conclusion – Hadopelagic waters: follow the Ocean**

We approach the end of our exploration. We have reached Hadopelagic waters, the darkest and coldest depths of the Ocean, which remain largely unexplored. Throughout this journey, I embarked on a hybrid methodology, where I tried to unveil the systematic and complex entanglement taking place in our more-than-human Ocean. I did so through the ambivalent metaphor of Medusa, taking on the goal of including emotional relevance to scientific inquiry (Ingold 2018) and investigating human relationship with the Ocean within the framework of the Blue Humanities (Oppermann 2019). In an attempt to “think with water” (Chen et al. 2013), I chose the metaphor to be my muse. In fact, the Blue Humanities are always mediated, because human experience underwater cannot be but. Hence the current of thought, much like the body of water, is scientific and technological while being as ancient as the first human concoctions on the Ocean through fantasy, tales, and stories (Oppermann 2019, 445).

The Ocean is twofold: it is simultaneously a geographical site and a vast domain of imagination. It is both *Alien* and *Core*. Since the Blue Humanities aim at creating new hydroecological frameworks that move away from treating water the same as land, they need to take into account this ambivalent nature of the Ocean, one that is *Alien* and *Core* at the same time. Scholars argue that one effective way in this practice is the metaphor, because metaphors enact a material figuration, they are aqueous, fluid yet tangible, and allow us to take into account the twofold nature of the Ocean when we tell oceanic stories. Metaphors are “part of the semiotic fabric of the universe and cognition” (Wheeler 2014, quoted in Oppermann 2019, 449).

In all three chapters we have seen the recursive theme of mediation between us and the Ocean. Our means of transportation to navigate the waters was Medusa in all her figurations, whom I invited to join us in exploration under different metaphoric forms. In fact, we held on to different tentacles as we explored the three metaphors that floated and disclosed the truth. The first one was the jellyfish, an embodiment of the anthropogenic and multispecies network of disruption in today’s more-than-human Ocean. The second one was

the raft of the Medusa, a metaphor for colonization and oceanic exploration where we explored current routes of migration and work at sea. Finally, the third one was the chthonic goddess Medusa, metaphor for all the submersed chtonians being undisclosed on the bottom of the ocean. Much like the Ocean, all these metaphors are ambivalent and dualistic.

The first chapter examined the contrasting perception humans have of jellyfish, animals so fascinating and enchanting yet repulsive and uncanny. The second chapter went through the narrative of shipwreck, a cognitive image and figuration theorized by Steve Mentz that portrays potential through devastation. This paradox is epitomized by the aesthetic force of the devastating scene of shipwreck portrayed by Théodore Géricault in his painting *The Raft of the Medusa*. This contrasting narrative symbolically recalls the contrast between the abusive forces of the West inflicted on the South, and how today they are diffused through a globalized world as well. In the third chapter, we have explored the history of the misunderstood Medusa, a myth ever so plastic that keeps morphing to this day. Epitome of duality between her beauty and desirability on one side, and her brutality and petrifying power on the other, Medusa was the key figure to show us the ambivalence of deep sea resources, so precious and delicate while rendered so distant and cold from the paradigm of extraction.

While my metaphors were an attempt to present the current issues of the Ocean in an unconventional and disruptive way such that allowed me to approach them in their complexity and fluidity, I focused on the least enjoyable pole of these dichotomies because my goal was to show the potential fertility of anxiety, worry, and grief that can stem from reading my thesis. The 2021 study by Ojala et al. explores the positive aspects of worrying about climate change and other environmental issues. An example is environmental engagement, showing that worry is linked to a belief in one's ability to influence problems and various forms of engagement, from daily actions to policy support and collective efforts. Although limited in number, studies suggest constructive coping mechanisms like meaning-focused coping that may help people channel their worry into constructive actions and prevent it from leading to reduced well-being. Indeed, participatory approaches, as well as strategies that are

place-based and culturally relevant, can aid individuals in coping with these emotions.

Global drivers of Ocean Literacy are education, cultural connections, technological developments, and knowledge exchange and science-policy interconnections (Kelly et al. 2022, 127). What I showed with my thesis is that ecological grief in front of ecological loss can be seen as a figurative dimension that on a bigger scale embraces all the other drivers as well. Since emotional answers to anxiety, worry, and grief can be experienced in many different ways, they can lead to different forms of engagement as well. For example, art-science is currently very invested in the field of Ocean Literacy, increasing in popularity both among artists and the general public (Whittaker 2023). Moreover, oceanic traffic and its repercussions might lead to different choices of consumption. In addition to this, a look into practices of extraction might trigger different kinds of communal activity, who could respond with activism (Ojala et al. 2021) and/or with Ocean Literacy oriented policy making (Morgera et al. 2023).

From this perspective, I would say that the Ocean reacts as well. While seemingly being a cruel and detached *Alien*, the Ocean is also participating in the active response, its *Core* not an inert spectator. In her song *To Speak as if the Ocean Does Not Remember All*, South African artist Donna Kukuma sews the wavy nets that are engaged in the labor of care and reparation.

In speaking of the ocean we often speak as though water has borders.  
We speak as if the Atlantic Ocean does not bleed into the Indian.  
We speak as though the Indian Ocean does not overflow into the Pacific.  
We speak as if the Pacific does not rise towards the Arctic,  
As if the Arctic does not melt back into the Atlantic,  
As if the Atlantic never kissed the Mediterranean Sea,  
As if the Mediterranean Sea is not the Atlantic's memory bank, As if the  
Mediterranean is not the Black Sea's first cousin,  
As if the blackening of the Gulf of Mexico did not spill into the Caribbean,  
As if the Caribbean Sea does not continue to sing the songs of the Atlantic.  
We speak as if the ocean does not speak the language of resistance and uprisings.  
As if these forms of resistance do not recognize a world other than our own.  
This is the world at the bottom of the ocean. (Kukuma as quoted in Zyman 2021)

Kukuma's song lets us recall that the principles of Ocean Literacy are guidelines, which are divided to be tackled more precisely, but in reality we know that they all refer to one more-than-human Ocean. As one massive body of water, it needs to be addressed as such, including all of its leaky ghosts and monsters (Tsing et al. 2017). Acknowledging the historical significance of the long haul transoceanic shipping during Modernism is a key element to understand alien species and resource extraction today, as well as slavery and exploration and many more grim truths:

The 1610 Orbis Spike marks the beginning of today's globally interconnected economy and ecology, which set Earth on a new evolutionary trajectory. [. . .] In narrative terms, the Anthropocene began with widespread colonialism and slavery: it is a story of how people treat the environment and how people treat each other. The World Ocean flowed with the blood of Native Americans in the years after contact. Soon after the drowned bodies of the Middle Passage would further stain the waters" (Lewis and Maslin 2018, quoted in Mentz 2020, 36).

The legacy of this technology carries on today, where we are witnessing colonialism's enduring legacy permeating through climate history, present-day realities, and future trajectories (Sultana 2022, 5). Neoliberalism perpetuates imperialism, while fossil fuel capitalism and hyper-consumption fuels climate coloniality, towards the non-human as well. In addition to this, carbon colonialism is perpetuated in the technologies of extraction of "earth mineral grabs, deep ocean floor mining, enclosures of commons, destruction of local communities and ecosystems for singular gains" (Sultana, 2022, 5). The tentacles that tie humans and the Ocean are tight. We need to be accountable for our unintentional impacts, and responsible in a manner that is not only precautionary and preventive hence future-oriented, but also active in the present. We must confront the multifaceted consequences of our actions, including "scattered corpuses, the human, animal, textual, and intellectual flotsam and jetsam circulating through every ocean current in the world" (Mentz 2015, xvi).

As we reach the conclusion of this metaphorical journey, I encourage you to contemplate the insights garnered from our exploration together. In doing so,



let us reflect on the words conveyed by doctor Nesimi Ozan Veryeri (Gökalp 2022), recognizing the relevance of the values conveyed not only to Ocean conservation but to conservation efforts at large:

What we need the least to protect nature is science. Free will, self-control, decency, fair share. Our biggest calamity in this extinction process is hypocrisy. (Nesimi Ozan Veryeri quoted in Gökalp 2022)

With this in mind, my exploration will go on towards more unexplored waters. My aim is to keep following the more-than-human Ocean, and as I ride this wave, Mentz's words echo in my head, inspiring new figurations: "New narratives of ocean science remain to be written" (2019).

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