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# Siphonophorae Society

**Letizia Artioli**

Università Iuav di Venezia, Italia

**Folco Soffietti**

Università Iuav di Venezia, Italia

**Paolo De Martino**

Università Iuav di Venezia, Italia; Delft University of Technology, The Netherlands

**Hadi El Hage**

Università Iuav di Venezia, Italia; Delft University of Technology, The Netherlands

**Abstract** Framed as a speculative essay, the text introduces the ‘Siphonophorae Society’ as a metaphor for the interdependence of human communities and water across porous land–water boundaries. Inspired by the biology of siphonophore colonies, it proposes ‘hundred-eye seeing’ as a multiperspectival epistemology that integrates human, more-than-human, and amphibious futures. It reframes ocean citizenship as water citizenship, articulating a relational mode of belonging grounded in hydrosocial interdependence. Through the Venice Lagoon, it contrasts technocratic planning with amphibious living and imagines adaptive collective futures in the Hydrocene.

**Keywords** More-than-human design. Water bodies. Civic design. Siphonophorae Society. Amphibious living.

**Summary** 1 Introduction. – 1.1 Relational and Wet Ontologies, Hydrofeminism, and Amphibious Thinking. – 2 Toward Siphonophorae Societies: A Speculative Ecology of Collective Adaptation. – 2.1 Siphonophorae. – 2.2 Siphonophorae Societies: Floating Through Uncertainty and Vulnerability with Hundred-Eye Seeing. – 3 The Venice Lagoon: A Siphonophorae Society? – 3.1 Venice and Its Amphibious Risks: A Loss of Co-Existence. – 3.2 Planning Regulation and Lagoon’s Rights. – 4 Conclusion.



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## 1 Introduction

Water is the matrix that has shaped human and ecological life since its beginning, forming our landscapes, sustaining ecosystems and bodies, transcending scales from our flesh to the rivers/veins that run across lands, connecting seas to the ocean. Nevertheless, for decades the human-built environment has approached water primarily as a resource or obstacle to be controlled, treating it as an inert technical variable rather than engaging with it as a dynamic, living ecosystem and entity. As the boundaries of coastal territories shift under accelerating climatic and socio-ecological pressures, the frontier between land and water has become increasingly porous, escalating ecological distress, deepening vulnerabilities across species, and intensifying socio-ecological imbalance. Thinking through the porous landscape at the forefront of climate change reminds us of the “mutual vulnerability of both planet and people”; neither can evade a “sense of precarious, corporeal openness to the material world” (Alaimo 2009 quoted in Neimanis 2014, 23).

The re-orientation and the paradigm shift of design with/within/as water, advocating for practices that align with hydrological processes rather than oppose them, is urgent: by 2050, half of the global population is projected to inhabit water-stressed regions (UNESCO, UN-WWDR 2024; OECD 2016), while already 90% of natural disasters are water-related, with climate-driven extremes (UNDRR 2020; IPCC 2022) having risen by more than 50% since the 2010s with intensifying heavy precipitation, coastal flooding, and compound events documented across multiple regions (IPCC AR6 WGII 2022; WMO 2023). These hydrological disruptions rarely occur in isolation; instead, they intersect and cascade across infrastructural, economic, and public health systems, underscoring the need for integrative, adaptive, and ecologically attuned design methodologies that cross layers of society. In this essay, the metaphor of Siphonophorae Society is a lens for conceptualising the adaptation of human structures to uncertainty and their entangled relationship with water (Neimanis, 2018; Giaccardi 2024).

Through the figure of the Siphonophorae, the essay advances a speculative yet logically valid metaphor for reimagining social-ecological relations in the Hydrocene. Siphonophores, marine colonies composed of differentiated yet interdependent zooids, offer a potent image for relational sociality: an organism that is many and one simultaneously, adaptive, fluid, and collective.

Within the Hydrocene, a term denoting the disruptive epoch in which water assumes a central role in understanding and addressing the global climate crisis (Bailey-Charteris 2024), the water cycle emerges as more than a closed physical system: it becomes a deeply entangled process that mirrors the life cycle of matter itself. Water is

not simply 'centric' but fundamentally cyclic, pervasive, and dynamic. This shift in perspective operates across multiple temporal and spatial scales, dissolving conventional boundaries between disciplines and between society and nature. Contemporary citizens inhabit a liquid society (Bauman 2007), immersed in 'thick time' (Neimanis 2014), where stability yields to adaptability. In this context, water serves both as a literal material force and as a symbolic register of fluidity, embodying the uncertainties and interdependencies of climate change, globalization, and social inequality. The movement of water through ecological and social infrastructures parallels the current cracks of modern life, reinforcing the profound human-ocean nexus that underpins survival.

The hydrosphere constitutes one of the planet's most expansive relational layers, a dynamic medium in which multispecies sustainability unfolds through patterns of interdependence. Within this watery domain, no entity exists in isolation: species, materials, infrastructures, and environments are co-shaped by the flows that circulate among them (Rupprecht et al. 2020). Amphibious futures, wherein novel geographies emerge at the shifting boundaries between land and water in response to climate change and environmental upheaval, cannot be conceived solely through human-centred lenses; they must instead attend to the entangled livelihoods, vulnerabilities, and agencies of the many beings who share and co-create ecological systems. Such futures do not just require resistance to water but invite us, "terrestrial beings" (Mentz 2021), to imagine new urban forms, strategies, and governance models fundamentally shaped by its presence (De Martino et al. 2026). The hydrosphere exemplifies this condition; it is both shaped by the bodies, sediments, and metabolic processes it contains, and simultaneously constrains, nourishes, and transforms those bodies in return. Water and its multiplicity and multitude of bodies is a coextensive field of life where human and more-than-human futures are inseparably intertwined.

This invites us to view seas, rivers, lakes, and oceans as dynamic, relational entities, intimately intertwined with both human and more-than-human histories. The hydrological cycle is a relational system that interconnects and organises human infra-structures: cities, societies, cultures. We are bodies of water and water bodies (Neimanis 2017). We are part of a larger aqueous system that dissolves the illusion of isolation and binds us to the planet and to other bodies, at molecular and relational scales. This perspective encourages us to see water in multiple meanings: a nexus of ecological, social, and cultural relations through which life becomes entangled, sustained, and flows incessantly. Adopting a water-centered perspective requires a radical shift in how we design, but even more fundamentally in how we perceive our role as individuals and as a society within the porous boundaries of water territories. It calls for recognising that

we are part of, rather than apart from, the very systems we have long attempted to control, shape, and define. Instead of positioning water as an external challenge to be managed, this view situates human agency within a larger hydrological constellation, demanding forms of planning and governance grounded in reciprocity, interdependence, and coexistence within water bodies.

### 1.1 Relational and Wet Ontologies, Hydrofeminism, and Amphibious Thinking

This broader reorientation invites a shift in perception: seas, rivers, lagoons, fjords, glaciers, lakes, and aquifers must be understood as dynamic relational entities, co-created by human and non-human histories. Relational legal scholarship echoes this turn; in Chile, for example, ongoing water law reform highlights the need for governance frameworks grounded in reciprocity, responsibility, and Indigenous authority rather than exclusive property rights (Macpherson et al. 2023).

Hydrofeminism (Neimanis 2012) deepens this argument by emphasising that humans are themselves bodies of water: permeable, interconnected, and entangled. Hydrofeminist thinking destabilises notions of individualism and autonomy, replacing them with an ontology of circulation and relationality. It calls on us to see water not simply as a resource but as a nexus of ecological, social, and cultural relations: a medium through which bodies, ecosystems, infrastructures, and emotions flow together. Through this lens, water becomes an active agent that links past and present, the local and the planetary, the human and the more-than-human.

This hydrosocietal approach, recently approached through a hydrofeminism perspective, aligns with and expands into a broader conceptual terrain that includes amphibious thinking and wet ontologies. The philosophical roots of amphibiousness lie in wider shifts within posthumanist and new materialist thought, where scholars emphasise the inherent porosity of human and non-human bodies and the constitutive role of water in shaping these bodies. Authors such as Astrida Neimanis (2017) and Karin Bolender (2015) illuminate how watery interconnections define embodiment: humans are not merely surrounded by water but metabolically, materially, and ethically made of it. In *Bodies of Water*, Neimanis (2017) reframes embodiment as a hydrological condition, underscoring that bodily boundaries are not fixed but in constant exchange with fluid environments.

Similarly, Steinberg and Peters (2015; 2019) develop the concept of a “wet ontology”, which challenges the territorial, hierarchical, and epistemological fixities of modern thought. The sea, in their account,

is not an empty surface for navigation or extraction but a dynamic medium that dissolves categories and unsettles the certainties of terrestrial worldview. To think amphibiously is thus to think from within liquid environments, to embrace motion, uncertainty, and ongoing transformation as fundamental conditions of being, rather than anomalies to be controlled or stabilised.

Anthropological engagements with amphibiousness further ground these ideas in empirical contexts. Scholars such as Tetsu Morita (2016) and Franz Krause (2017; 2019) explore how deltaic and riverine communities cultivate ways of living that attune to rhythms of flooding, sedimentation, and retreat. Krause (2019), in his study of the lower Rhine, describes amphibious living as “dwelling in flux” – a mode of life in which settlements, infrastructures, and social practices adjust to hydrological variability rather than resisting it. This orientation shifts attention from control to cohabitation, from fixed infrastructures to flexible, relational arrangements that move with water rather than against it.

Within this broader landscape, hydrofeminism becomes a vital bridge. As a theoretical framework merging feminist thought with environmental studies, hydrofeminism foregrounds water’s pivotal role in ecological and human systems (Neimanis 2012; 2017; Neimanis, Walker 2014; Engelman et al. 2022; Zylinska 2014). It underscores interconnectedness and challenges entrenched dualisms – nature/culture, human/non-human, subject/object – while promoting a more inclusive and holistic understanding of ecological relationships. Applied to water, hydrofeminism positions rivers, lakes, oceans, and groundwater not as passive reservoirs but as dynamic, relational bodies embedded in cultural, social, and ecological narratives. It invites deeper reflection on how water shapes and is shaped by interactions across species, infrastructures, and scales.

Through this essay, the aim is to contribute to unsettling the entrenched dualisms that have long governed territorial and epistemic imaginaries, chief among them the binaries of land/water and nature/culture. The change that is needed to reach amphibious futures aligns as part of the needed changes in the realm of the symbolic and systems of meaning to open new collective horizons for action (Rupprecht et al. 2020; Leventon et al. 2021). The idea of Siphonophorae Society invites a dissolution of these divides, revealing instead the fluid continuities and relational entanglements that shape amphibious worlds. The reconfiguration of collective imaginaries is essential for opening new horizons of action, enabling societies to envision and enact toward amphibious futures in which interdependence, reciprocity, and watery relationality guide both governance and everyday life (Yanquiling et al. 2024; Global Alliance

on the Rights of Nature 2021).<sup>1</sup> Having let sediment the theoretical foundations of wet ontologies, the essay now turns to the central metaphor: the floating siphonophores. The following section develops the concept of a Siphonophorae Society as a speculative framework for collective adaptation, before Section 3 examines these ideas through the concrete case of the Venice Lagoon: an illustrative site that reveals the tensions between technocratic water management and relational amphibious living.

## 2 Toward Siphonophorae Societies: A Speculative Ecology of Collective Adaptation

### 2.1 Siphonophorae

Siphonophores are complex, polymorphic marine organisms whose colonies consist of multiple polypoid and medusoid zooids. While each zooid maintains a degree of individuality, the colony functions physiologically as a single organism. (Mackie et al. 1988)

Siphonophores (lat. order *Siphonophorae*) are complex marine beings whose colonies, composed of multiple polypoid and medusoid units (zooids), embody a striking duality: while each unit retains a degree of morphological individuality, the colony operates physiologically as a single organism [fig. 1]. This enigmatic dual condition has long captivated scientific curiosity. In the latter half of the nineteenth century in particular, naturalists devoted meticulous attention to these organisms, collecting intact specimens from ocean surfaces and producing detailed anatomical descriptions. Their efforts sought to decipher the hybrid architecture of siphonophores, interpreting the origins and functions of their differentiated “entities” (Mackie et al. 1988). Siphonophores are therefore chosen as they embody an existing ‘paradox’-organisms that defy and float overcoming conventional dualities. The siphonophore becomes a metaphor for collective social and ecological organization through its distributed, interdependent architecture. At the same time, its very physiology invites us to rethink entrenched dichotomies. Composed largely of water, its organs appear fragile, almost ephemeral, yet the colony endures the crushing pressures of the deep sea, an environment that is simultaneously its surroundings and its constitutive medium.

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<sup>1</sup> Global Alliance for the Rights of Nature (s.d.). *What Are the Rights of Nature?* <https://www.garn.org/rights-of-nature/>.



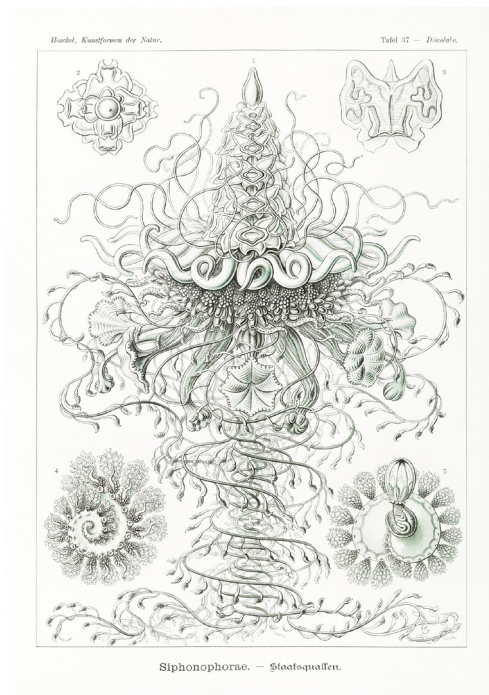
**Figure 1** Ernst Haeckel, *Siphonophorae*. 1904. Illustration. Jena, Verlag des Bibliographischen Instituts, Germany. Image from *Kunstformen der Natur*, Plate 77, public domain

An unusual feature of siphonophores lies in the extraordinary range of possible configurations (or “body plans”) they can assume (Mapstone 2014). Their colonies unfold in multiple architectures, from elongated filamentous forms [figs 1-2] stretching tens of meters through the water column to compact, intricately organized aggregates [fig. 3], each arrangement expressing a different mode of collective life. Despite this morphological diversity, siphonophores

share a remarkable material composition: more than 85% of their bodies are water (Mackie et al. 1988). Their gelatinous appearance suggests fragility, yet this impression is deceptive. Many species inhabit deep-sea environments where hydrostatic pressures are immense, far exceeding what most terrestrial or shallow-water organisms could withstand. Siphonophores thrive in deep-sea zones by maintaining buoyancy through low-density tissues, minimising metabolic costs, and relying on structural simplicity that resists compression at depth. In this way, siphonophores exemplify a paradoxical robustness: organisms that are at once delicate in substance yet capable of flourishing under some of the ocean's most extreme physical conditions (Mapstone 2014; Mackie et al. 1988).

**Figure 2**  
Ernst Haeckel, *Siphonophorae*.  
1904. Illustration. Jena,  
Verlag des Bibliographischen  
Instituts, Germany. Image from  
*Kunstformen der Natur*, Plate 59,  
public domain





**Figure 3**  
Ernst Haeckel, *Siphonophorae*.  
1904. Illustration. Jena,  
Verlag des Bibliographischen  
Instituts, Germany. Image from  
*Kunstformen der Natur*, Plate 37,  
public domain

As Alaimo argues, abyssal and deep-sea creatures' aesthetics might initially appear unusual, flimsy, fragile, or inadequate when measured against the grave scale of anthropogenic harm to oceanic life (Alaimo 2024). If oceanic aesthetics have traditionally been framed through the sublime, anchored in sweeping views across the sea's surface, such perspective framing proves insufficient for the deep. In an era marked by extinction, what is needed instead is a creaturely aesthetic, grounded in highly mediated, situated encounters with particular beings of the depths, a "submersive" perspective (Whittaker et al. 2025) that resists abstracting the ocean into sheer immensity. Such an aesthetic does not abstract the ocean into immensity, but attends carefully to the singular lives and vulnerabilities that compose its more-than-human communities (Alaimo 2024). The organism thus provides a productive metaphor for collective forms of social and ecological organization, bridging the individual and the societal scale.

Water, in this organism, is both inside and outside, both substance and milieu, both what the body is made of and what the body inhabits. Such a configuration unsettles familiar categories and challenges the view of water as merely a connector, environment, or resource. Instead, the siphonophore reveals water as relation,

as ecology (Mentz 2021), as living entity (Neimanis 2017), as media and medium (Jue 2020) an element that dissolves boundaries even as it sustains differentiated forms within a shared, fluid existence. Such a perspective urges us to reflect more deeply on how water epistemologically shapes, and is in turn shaped by, its interactions with living worlds and with complex networks, intertwining social and ecological dimensions (Barad 2007; Jue 2020).

Drawing on the metaphor of the siphonophores, human structures, such as societies and cities, can be understood as similarly distributed and interdependent organisms, whose physical and social configurations mirror the porous and adaptive logics of siphonophores colonies. Like these marine assemblages, several parallel watery characteristics emerge:

- i. Porosity and permeability: Cities are shaped by continuous exchanges of water, matter, and energy, functioning as permeable systems governed by hydrological fluxes rather than fixed boundaries. Venice offers a paradigmatic example: its canals operate as liquid arteries that nourish, regulate, and sustain urban life, revealing how water circulates through the city as both infrastructure and living medium.
- ii. Water as constituent: Water is not merely present within settlements but is a fundamental element of their constitution; material, ecological, and symbolic. It shapes patterns of habitation, mobility, metabolism, knowledge making and social meaning.
- iii. Individual-collective interplay: The siphonophore's dynamic relationship between specialized units and the collective whole resonates with the human structures such as urban agglomerates, where buildings, neighborhoods, and actors acquire meaning and function only through their relation to broader socio-ecological systems. In this framing, the city emerges as a composite organism, a fluid assemblage in which individual and collective forms are co-constituted through shared dependence on dynamic, watery environments.

## 2.2 Siphonophorae Societies: Floating Through Uncertainty and Vulnerability with Hundred-Eye Seeing

### 2.2.1 Floating Through and Within Uncertainty and Vulnerability

The metaphor of a Siphonophorae Society offers a generative lens for conceptualizing social adaptation under conditions of vulnerability and uncertainty (Neimanis 2018; Giaccardi 2025). Just as siphonophores are composed of differentiated yet interdependent zooids that function simultaneously as individual units and as a single collective organism, human societies too are assemblages of interconnected individuals, communities, and institutions whose actions unfold across multiple scales at once. Recognising these interdependencies demands a reorientation of our narratives, practices, and imaginaries, treating uncertainty as an inherent condition of life within the Hydrocene. In this view, vulnerability becomes a shared medium, an ecological and social connective tissue that binds human and more-than-human worlds within the fluid dynamics of planetary ecologies.

Cultivating the epistemological and practical capacities to navigate such “uncharted waters” requires interdisciplinary and inter-ontological forms of collaboration (Jue 2020), spaces where diverse knowledge systems, design approaches, and situated perspectives can converge to imagine and shape future scenarios (Overbeek, Bessembinder 2013). Within this framing, the redistribution of vulnerability becomes central: a shift from individualized notions of risk toward collective responsibility and ocean/marine citizenship (Squarcina, Pecorelli 2017; Buchan et al. 2023), where agency is exercised not in isolation but through relational entanglement.

Engaging uncertainty, then, is not merely a technical challenge but a generative force. Uncertainty is intrinsic to the very act of designing, particularly when design seeks to intervene intentionally within complex, dynamic, and evolving worlds (Giaccardi 2024). It shapes the iterative, experimental nature of prototyping physically as much as epistemologies, and fosters deeper attunement to the reciprocal relations and flows between intention and emergence, as intra-action (Barad 2007). In Siphonophorae Societies, uncertainty becomes a condition of possibility through which adaptive, amphibious, and collectively imagined futures may take shape and flow.

### 2.2.2 Hundred-Eye Seeing Perspective

The idea of a Siphonophorae Society draws on this metaphor to conceptualise modes of symbiotic living appropriate to an age defined by hydrological instability and planetary entanglement. It envisions society as amphibious, distributed, and intrinsically collective, capable of navigating liquid futures by embracing uncertainty rather than resisting it. In such a framework, vulnerability becomes shared, knowledge becomes multi-perspectival ('hundred-eye seeing'), and adaptation emerges from relational rather than extractive logics.

Such complexity necessitates multiperspectival frameworks, such as the "two-eyed seeing" approach in Ocean Literacy frameworks (Glithero et al. 2024), which brings Indigenous and Western epistemologies into dialogue to expand Ocean Literacy (Jefferson et al. 2021). To extend this principle, a 'hundred-eye seeing' perspective (modeled on the distributed sensory capacities of siphonophores) foregrounds the integration of diverse human and more-than-human ways of knowing into environmental imaginaries and governance. Fostering sustainable practices and ethical human-ocean relationships (Buchan et al. 2023), this collective epistemology resonates with the reconceptualization of marine citizenship (Buchan et al. 2023), which shifts attention from individual behavioral change to socially embedded and politically collective practices through "restoring society's relationship with the ocean" (UN Ocean Decade Goal n. 10, Glithero et al. 2024). Hundred-eye seeing extends the framework by calling for integrative knowledge that crosses disciplinary, cultural, and experiential boundaries to foster informed stewardship (emphasising the need for societies to understand the human-water nexus) drawing inspiration from the siphonophore's distributed sensory capacities.

Rather than a dual perspective (as the "two-eyed seeing" suggests, based on human ways of seeing), hundred-eye seeing suggests an expanded epistemic field, one in which knowledge is gathered and interpreted through many simultaneous view points: multiple scales (bodily, urban, planetary, climatic, hydrological); multiple more-than-human perspectives and ecologies (marine mammals, plankton, sediments, currents, infrastructures); multiple modalities of sensing (embodied, technological, emotional, ancestral, experiential). Enabling access across disciplines, communities, and media, this approach fosters horizontal knowledge-sharing that empowers non-specialists to participate meaningfully in decision-making (Artioli et al. 2025), broadening knowledge systems by integrating diverse forms of data and experience, embedding Indigenous and often overlooked epistemologies, and opening towards more-than-human perspectives. Such horizontal access becomes foundational for building trust across scales, weaving together knowledge,

experience, and relational accountability. Recognising the distinct languages and mediums through which human and more-than-human worlds articulate meaning, this approach emphasises inclusive, multimodal, and multispecies ways of knowing (Tsing et al. 2021; Jue 2020; Giaccardi 2018; Haraway 2004), deepening our collective understanding of hydrosocial environments (McFarlane 2025).

Water itself, in this vision, is a co-author of social futures. A Siphonophorae Society calls for infrastructures, institutions, and imaginaries that move with water rather than against it: floating squares, amphibious public spaces, permeable boundaries, and collective forms of stewardship that acknowledge the hydrosocial entanglements of the Hydrocene. A Siphonophorae Society is, in this, a society that recognises itself as an organism intrinsically embedded within the water cycle, that becomes capable of hundred-eye seeing and oriented toward an expanded form of ocean citizenship.

The notion of a Siphonophorae Society establishes a parallel between the collective floating of siphonophore colonies, their distributed sensing, buoyancy, and interdependence, and the forms of shared responsibility and vulnerability required for regenerative socio-ecological practices. In these marine assemblages, survival depends on the coordination of multiple differentiated parts, each contributing to the vitality of the whole. Similarly, human societies must cultivate modes of perception and action that exceed individual viewpoints, embracing collective attunement as a condition for navigating hydrological uncertainty.

### 2.2.3 Water Citizenship

This expanded seeing reconfigures how epistemic authority is distributed. It proposes that understanding the hydrological cycle, and living responsibly within the hydrosphere, requires an interplay of situated knowledge (Haraway 1988), relational ontologies, and multispecies attunements (Jue 2020). In this sense, hundred-eye seeing becomes a collective epistemology (Tsing et al. 2021), where perception is not the task of a single actor but the emergent outcome of diverse forms of sensing and interpreting. By foregrounding imagination (Rupprecht et al. 2020), empathy, and multispecies storytelling (Vervoort et al. 2024) as vital ways of perceiving the complexity of water bodies, hundred-eye seeing invites a mode of attention attuned to the submerged (Whittaker et al. 2025), the invisible, the speculative, and the more-than-human (Giaccardi 2024; Jue 2020), much like the siphonophore colony perceives its environment through the aggregation of many distributed sensors.

Ocean citizenship (Buchan et al. 2023) builds on this epistemic foundation by proposing a mode of belonging and responsibility

that recognises the ocean as a socio-ecological community to which humans are intrinsically connected. Rather than limiting citizenship to legal or territorial definitions, ocean citizenship reframes it as an ethical-political relationship grounded in interdependence.

Within a Siphonophorae Society, ocean citizenship can be broadened by drawing directly from the individual-collective interconnectedness that defines siphonophore colonies, becoming what is termed here “water Citizenship”, a relational mode of belonging and responsibility that extends ocean citizenship beyond the marine domain to encompass the full spectrum of hydrosocial relations, including rivers, lagoons, groundwater, and the hydrological cycle as a whole.

This broader approach is intended to offer a stronger interconnection with the water element, with the aim to fully acknowledge land-sea interactions and the general relationship that all citizens, in all part of the world, have with water. Just as each zooid participates in the vitality of the whole organism, civic engagement emerges through reciprocal, distributed forms of action that must acknowledge the role of water in our lives. This resonates with the dimensions of civic design (Fagnoni 2022) and the principles of ocean-cycle-centric design (Artioli et al. 2025), which highlight practices aimed at expanding civic participation and embedding citizens more deeply in decision-making processes. Participation is fundamental to what counts as civic, and involves fostering high levels of interaction (Di Salvo, Le Dantec, quoted in Fagnoni 2022) between people, between people and material or digital artifacts, and within the everyday bureaucratic and relational infrastructures that shape collective life. In this sense, design becomes not a neutral tool but a situated ethics and innovation philosophy for working with change (Bason in Fagnoni 2022), opening speculative and alternative trajectories for amphibious futures.

Within a broader hydrosocial register, design can activate emotional, embodied, and imaginative engagements with water bodies, creating inclusive spaces, narrative platforms, and participatory experiences that encourage empathy, shared responsibility, and co-creation. Through physical or virtual encounters with water bodies, accessible across gender, geography, physical ability, and cultural background, design reduces social and economic barriers while deepening affective connections to aquatic environments. In such contexts, ocean citizenship is enacted through multi-stakeholder participation, where citizens and communities co-shape policies, scenarios, and practices alongside institutional actors (Berkowitz et al. 2020; Weiland et al. 2021; Haas et al. 2022; Boteler, Durussel 2022; Tompkins et al. 2008). Crucially, this participatory field also extends to more-than-human communities, recognising non-human beings

and ecosystems as rights-bearing participants whose needs must be represented at the decision-making table. The emerging indicators for this expanded practice emphasise the importance of connecting communities to ocean citizenship, aligning human action with the collective, interdependent logics that sustain a Siphonophorae Society.

The metaphor of the siphonophores reinforces this interconnectedness perspective, fostering a deep ecology (Naess 1973) shift: in a colony where each zooid has a specific role, no part can survive independently, and collective survival relies on coordinated contributions, actions become not isolated efforts but interconnected strands of a single socio-ecological organism that spans over dimensions, from the micro to the macro planetary scale (Lovelock, Margulis 1974; Naess 1973).

Water citizenship emphasises this relational responsibility: acknowledging how individual and collective actions reverberate through water cycles and ecosystems. Water citizenship therefore becomes not only a set of actions but a mode of inhabiting, one that recognises water as a living entity rather than a commodity. It invites people to see themselves as actors within a broader hydrosocial system, where duties and capacities emerge through shared vulnerability. Such civic participation becomes possible through informed engagement in governance and stewardship, through cross-scalar action that links personal practices with community initiatives and institutional or transnational policies, and through a more-than-human recognition that acknowledges the rights, vulnerabilities, and agencies of non-human beings within the governance of water bodies.

This extends beyond stewardship to encompass affective, cultural, and imaginative dimensions (Amphibious Futures), to delve into how people emotionally relate to aquatic environments, how stories shape their understanding, and how cultural practices contribute to ecological care. Aligned with hydrofeminist thinking (Neimanis 2012; 2017), this perspective positions water bodies as relational entities and situates citizenship within shared vulnerability and co-constitutive embodiment. Ultimately, water citizenship becomes a practice of collective becoming, in which societies learn to live with the volatile dynamics of the hydrosphere. It is a political ecology of reciprocity, grounded in the same principles that sustain siphonophore colonies.

In sum, the Siphonophorae Society, integrating the notions of hundred-eye seeing and water citizenship developed above, proposes a mode of collective inhabitation as amphibious, distributed, and intrinsically collective, capable of navigating amphibious futures by embracing uncertainty rather than resisting it. Knowledge becomes multiperspectival (and multi-spectral), and adaptation proceeds through relational rather than extractive logics. It

calls for infrastructures, institutions, and imaginaries that move with(in) water rather than against it, navigating together shared vulnerability, distributed sensing, and collective buoyancy that sustain siphonophore colonies. The following section examines how these principles fare when confronted with the concrete realities of the Venice Lagoon.

### 3 The Venice Lagoon: A Siphonophorae Society?

Writing this essay from the lagoon, Venice, a city that could float, sense, and adapt like a siphonophore, one can nonetheless observe a series of countercurrents that unsettle this potential. Starting from its urban shape, resembling a fishy-sea entity ‘floating’ in the lagoon [fig. 4], the city represents one of the historically and widely known cases of “living with water” (Fabian, Centis 2022) and, as such, it could be expected that its current urban planning strategy and its legal status development reflect this aspect. Historically, the planning of Venice emerged from the aggregation of insulae, small, self-contained island units that were incrementally connected through bridges, canals, and shared infrastructures (Spurr 2016). This insular structure produced a city conceived not as a continuous landmass but as a networked amphibious archipelago, where urban form and governance evolved through relational linkages across water.



**Figure 4** Joseph Heintz the Younger, *Bird's-Eye View of Venice*. Painting, oil on canvas. Fondazione Musei Civici di Venezia, Museo Correr, Venice, Italy. Image from Wikimedia Commons, public domain

Cities are shaped by continuous exchanges of water, matter, and energy, functioning as permeable systems governed by hydrological fluxes rather than fixed boundaries. Venice offers a paradigmatic example: at the same time city and breathing lagoon ecosystem, its canals operate as liquid arteries that nourish, regulate, and sustain urban and tidal life, revealing how water circulates through the city as both infrastructure and living medium. The proposed framework is explored in the case of the Venice Lagoon. Hence, to investigate this assumption, the principal planning instruments are reviewed, including the Regulatory Plan for the Lagoon and the Islands, and a series of ongoing initiatives are analysed to compare and seek the presence of principles of a Siphonophorae Society.

### 3.1 Venice and Its Amphibious Risks: A Loss of Co-Existence

Venice functions in this essay as a critical case study that renders visible the tensions between technocratic water management and relational amphibious living, tensions that the Siphonophorae framework is designed to address. Where the Siphonophorae Society posits a distributed, relational, and adaptive logic of cohabitation with water, Venice today presents a paradoxical counter-image: a city historically constituted through amphibious coexistence that is progressively relinquishing that condition in favor of technological stabilization. This section traces that trajectory: from Venice's historically amphibious condition, through the technological intervention of MOSE, to a planning critique and an account of emerging civic responses, in order to illuminate what is at stake when the distributed, responsive logic of a Siphonophorae Society gives way to the centralised management of risk.

In Venice, the lagoon is more than a water landscape: it is a living relational ecosystem made of water, sediments, salt marshes, canals, biodiversity, and long-established practices that for centuries have shaped a way of inhabiting that is intrinsically amphibious. For this reason, the city is an emblematic case when thinking about how to live with water. Here, the relationship between communities and the environment has always been a process of co-creation, of reciprocal adaptation, of deep coexistence: a mode of life that resonates closely with the hundred-eye seeing of the Siphonophorae Society, where knowledge is gathered from multiple situated perspectives and governance proceeds through relational rather than extractive logics. For centuries, Venetians have lived in continuous negotiation with water, developing cultural practices, infrastructures, and forms of inhabitation that are inseparable from the rhythms and dynamics of the lagoon. This historically amphibious condition embodies precisely the kind of distributed, interdependent resilience that the

Siphonophorae metaphor seeks to theorise: a city as a collective organism, each insulae a zooid, each canal a connective filament sustaining the vitality of the whole.

However, these long-standing rhythms and dynamics of living with water have been fundamentally interrupted by the MOSE system. MOSE is an acronym for 'Modulo Sperimentale Elettromeccanico', a large-scale mobile barrier system designed to protect Venice and its lagoon from *acqua alta*, the increasingly frequent and severe high-tide flooding events. Since becoming operational in 2020, the MOSE has reconfigured the city's relationship to tidal cycles and transformed a historically adaptive mode of inhabitation into a technologically mediated one. Read through the Siphonophorae framework, MOSE represents a paradigm of centralized technocratic stabilization: a single, integrated control system that replaces the distributed, responsive, and relational logic historically embedded in Venetian life with a binary hydraulic switch. Rather than adapting with the lagoon, sensing its shifts, moving with its rhythms, cultivating cohabitation across species and scales, the MOSE apparatus seeks to hold water at bay, imposing a territorial fixity that the siphonophore colony, in its fluid and adaptive architecture, would never permit.

The presence of the MOSE system thus marks a profound turning point that significantly alters the way people have historically related to water. Flood protection, though necessary in the short term, radically transforms the perception and governance of risk, turning a cyclical natural phenomenon into a complex amphibious risk that intertwines ecology, culture, and technology while opening up unpredictable future scenarios. In this process, Venice seems to be relinquishing its amphibious condition in search of more stable, land-anchored ways of living.

A paradox emerges here that we do not see in other lagoon or coastal contexts. The MOSE system, designed to safeguard the city, is simultaneously putting the ecological balance of the lagoon under strain (Cibic et al. 2025). The mobile barriers hinder the natural sedimentation processes that nourish the salt marshes, reducing the supply of materials needed for their vertical growth. Recent studies show that these closures are already significantly decreasing the availability of sediments, accelerating the erosion of the salt marshes and threatening the biodiversity they support. Thus, the infrastructure that protects Venice today contributes to weakening the resilience of the lagoon's saltmarshes (*barene*) tomorrow (Tognin et al. 2021; 2022). In this respect, MOSE crystallizes the foundational tension the Siphonophorae Society seeks to overcome: the conflict between the illusion of control and the necessity of cohabiting with a living environment. The siphonophore colony does not attempt to arrest the ocean; it learns to float within it.

Additional pressures compound this situation: rising temperatures, morphological transformations, the fragility of a compact and historic urban fabric, conflicts between port, tourism, residential, and ecological uses, and a fragmented governance system spread across multiple scales that often fail to communicate. This fragmentation is itself symptomatic of an absence of the hundred-eye seeing the Siphonophorae Society calls for: a failure of multi-scalar, multi-perspectival attunement in which human, ecological, and institutional actors might co-navigate uncertainty together. Venice thus becomes a critical laboratory where tensions emerge between defensive technologies and ecological processes, between immediate safety and long-term sustainability, between the illusion of control and the necessity of cohabiting with a living environment.

The dolphin nicknamed Mimmo, sighted in the Venice Lagoon in the summer of 2025 and rapidly turned into a touristic spectacle, offers a telling illustration of this condition. Rather than being recognised as a fellow inhabitant of the lagoon, a participant in its multispecies community and an expression of its ecological vitality, the dolphin was folded into the logics of spectacle and consumption that increasingly govern the lagoon's social life. From a Siphonophorae Society perspective, such a moment could be read otherwise: as an instance of multispecies citizenship, evidence that the lagoon remains a shared territory of interdependent lives and ecosystemic interconnectedness, a reminder that governance must reckon with more-than-human belonging. That this recognition was largely absent from public discourse speaks to the depth of the anthropocentric logic the Siphonophorae framework challenges.

In this scenario, "water risk" cannot be addressed through traditional models: it requires a way of thinking capable of embracing uncertainty, reciprocity, and the fluidity of an amphibious world. And it is precisely here, at the heart of these contradictions, that Venice reveals its full paradigmatic power: not only as a city to be protected, but as a place that forces us to radically rethink what it means to live with water in the twenty-first century. Risk becomes a complex condition in which the Lagoon is engaged in a continuous negotiation between land and water. Amphibious risk thus signifies not only exposure to environmental change, but also the fear of losing a long-standing historical condition of co-existence: the loss, in other words, of the very relational, distributed, and adaptive vitality that the Siphonophorae Society seeks to recover and reimagine.

### 3.2 Planning Regulation and Lagoon's Rights

Recent scholarship in environmental and blue humanities, critical geography, and socio-ecological planning has increasingly highlighted the need to move beyond anthropocentric governance models and adopt frameworks such as more-than-human planning (Houston et al. 2018), rights of nature (Kauffman, Martin 2017; GARN 2021), and hydrosocial understandings of human-water relations (Budds 2008; Linton, Budds 2014). These approaches reconceptualise nature not merely as a resource to be exploited by human activity, but as an active agent with ecological, cultural, and legal significance. In the context of coastal and deltaic environments, where climate change, subsidence, and ecological degradation challenge traditional management systems, scholars increasingly call for planning paradigms grounded in co-existence, multispecies entanglements, and relational ontologies of water (Bailey-Charteris 2024; Tsing et al. 2021; Giaccardi, 2020; Neimanis 2017).

Against this backdrop, the Piano Regolatore Generale - Variante per la Laguna e le Isole Minori (General Regulatory Plan - Lagoon and Minor Islands), hereafter 'the Piano', approved in 2010<sup>2</sup> and subsequently amended, provides a revealing case for assessing the extent to which legacy planning instruments incorporate, or fail to incorporate, these emerging paradigms. This part examines the Piano and its amendments to determine whether it engages with concepts such as more-than-human approaches, rights-of-nature frameworks, living-with-nature paradigms, or socio-ecological understandings of human-water relationships.

The analysis draws on a review of the Piano and its official annexes, including the Valutazione Tecnica Regionale (Regional Technical Evaluation) and accompanying normative and cartographic materials approved by the Regione Veneto in 2010,<sup>3</sup> as well as subsequent administrative updates summarised in the amendment register. It shall be noted that the Piano was developed between 2004 and 2010, years before the normalisation of posthumanism, and at an early stage of integrated planning discourse in related disciplines. Given the scope and word limits of the present essay, the analysis offered here is necessarily preliminary and partial; it focuses on the conceptual orientations of the Piano rather than providing an

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**2** Comune di Venezia (2010). *Varianti al Piano - Schede e aggiornamenti*. [https://www.comune.venezia.it/sites/default/files/cartanet/VPRG\\_Laguna\\_isole\\_minori/Elenco\\_VPRG\\_PUA\\_aggiornati.pdf](https://www.comune.venezia.it/sites/default/files/cartanet/VPRG_Laguna_isole_minori/Elenco_VPRG_PUA_aggiornati.pdf).

**3** Regione del Veneto (2010). *Deliberazione della Giunta Regionale n. 2555 del 2 novembre 2010: Variante al Piano Regolatore Generale per la Laguna e le Isole Minori in adeguamento al PALAV*. [https://www.comune.venezia.it/sites/comune.venezia.it/files/page/files/DGRV-2555-02-11-2010%20\\_0.pdf](https://www.comune.venezia.it/sites/comune.venezia.it/files/page/files/DGRV-2555-02-11-2010%20_0.pdf).

exhaustive assessment of all its provisions and implementation outcomes. A more detailed and comprehensive evaluation would require dedicated study.

### 3.2.1 Conceptual Orientations of the Piano

#### Anthropocentric Framing and Technical Environmentalism

The Piano is grounded in the long-standing Italian tradition of urban and territorial regulation, which emphasises zoning, heritage preservation, and functional environmental protection (Vignozzi 1994). Across its normative and descriptive sections, the lagoon and its ecological components are framed primarily as objects of technical management, heritage assets, or constraints on development, rather than as relational or agential entities.

For example, the Piano identifies as its primary environmental objectives the “arresto e inversione del degrado del bacino lagunare” (pp. 5-6), translated as “the halt and reversal of the degradation of the lagoon basin”, articulated through sediment control, morphological stabilisation, and constraints on wave-inducing traffic. These aims, while environmentally beneficial, are operationalised through mechanistic and infrastructural interventions rather than through relational engagement with lagoonal processes. The underlying logic follows what Head (2016) describes as technical environmentalism, in which ecological systems are managed to maintain human uses, cultural landscapes, or regulatory compliance.

The classification of the lagoon into four ‘systems’ (*laguna aperta, isole e motte, valli da pesca, gronda lagunare*) and the detailed cataloguing of each island’s morphological, historical, and ecological features reinforce a managerial ontology where nature is segmented, stabilised, and rendered legible for the purposes of control (Scott 1998). Even ecological surveys, often extensive, as in the case of island-specific studies (Piano Regolatore, p. 12), serve primarily to delimit permissible human uses rather than to articulate a shared or co-constitutive human-nonhuman relationship.

## Absence of More-Than-Human or Multispecies Approaches

Contemporary more-than-human frameworks emphasise multispecies co-agency, ecological interdependence, and the ethical and political implications of human-non-human entanglements (Whatmore 2006; Haraway 2016). None of these orientations are present in the Piano. Neither its normative language nor its conceptual foundations recognise nonhuman entities as participants in planning, nor do they engage with relational ontologies that understand islands, waters, sediments, or species as co-shaping the socio-ecological landscape.

Instead, ecological components are consistently instrumentalised as constraints or values to be safeguarded for their contribution to landscape character, heritage, or environmental stability. No section of the Piano attributes agency, voice, or relational consideration to non-human actors, nor does it invoke ethics of cohabitation typical of the more-than-human planning literature.

## Rights of Nature: Complete Absence of Legal Ecocentrism

The rights-of-nature movement, formalised in jurisdictions such as Ecuador (2008), Bolivia (2010), and New Zealand's Whanganui River settlement (2017), posits ecosystems as legal subjects. The Piano contains no reference to such frameworks. Its legal basis rests entirely on established Italian and regional planning statutes, notably L.R. 61/1985 and L.R. 11/2004, and on European directives (e.g., Habitat Directive 92/43/EEC) which, while environmentally protective, remain resolutely anthropocentric. The Piano therefore does not conceptualise the lagoon or its ecosystems as rights-bearing entities, nor does it articulate governance structures that grant nature procedural or substantive standing.

## "Living with Nature" as Functional, Not Relational

Although the Piano includes measures that ostensibly resemble "living with nature", such as restrictions on motorboat traffic, protection of sedimentary processes, and recovery of historical ecological forms, these measures are justified primarily in terms of risk mitigation, heritage conservation, and maintenance of lagoonal usability. As such, they align with practical resilience measures rather than with relational or eco-philosophical approaches advocating coexistence with dynamic natural systems (Adger 2000; Neimanis 2017).

For instance, the plan's provisions to reduce wave motion and regulate navigation (pp. 10-11) are designed to protect island margins and historical buildings, not to foster an ethic of shared

agency with lagoon hydrodynamics. Similarly, the valorisation of traditional activities (such as voga veneta – Venetian rowing and Squeri – Traditional shipbuilders) is framed as preservation of cultural heritage rather than as recognition of long-standing socio-ecological interdependencies.

### The Human-Water Relationship: Hydraulic, Not Hydrosocial

Water in the Piano is conceptualised through a hydraulic-technical lens, consistent with the historical Venetian tradition of water engineering. References to water dynamics concern sediment flows, erosion, navigability, and the physical morphology of the lagoon. Absent are the conceptualisations of water typical of hydrosocial literature, which view water as co-produced through social, cultural, political, and ecological processes (Linton, Budds 2014).

Even when water is discussed in relation to human activity, the framing is strictly functional: the lagoon is an infrastructural space for transport, fishing, ecological conservation, and cultural heritage. There is no articulation of water as a relational medium, cultural signifier, or partner in governance. The result is a unidirectional conception of the human-water relationship, where humans act upon water systems rather than within them.

### Structural and Historical Reasons for the Absence of Relational Approaches

The absence of more-than-human, rights-of-nature, and relational water ontologies in the Piano must be situated in its historical and regulatory context. The document was developed between 2004 and 2010, preceding the widespread diffusion of posthumanist and relational frameworks in European planning discourse. Moreover, Italian spatial planning has traditionally emphasised in such as: anthropocentric land-use regulation, heritage preservation, technical environmental management, and juridical compartmentalisation of responsibilities.

Within this paradigm, nature is valued for its ecological function, scenic quality, or cultural significance, but not positioned as a co-governor or rights-bearing subject. The Piano's foundational texts and implementation tools reflect these conventions, privileging morphology, zoning, and normative prescriptions over relational or participatory ecological thinking.

## Absence of Scenario Thinking and Anticipatory Approaches

A further limitation of the Piano concerns its lack of engagement with scenario-based or anticipatory planning methodologies. Despite operating in a context characterised by pronounced ecological variability, socio-economic pressures, and accelerating climate-related risks, the Piano does not reference scenarios, uncertain futures, or forward-looking assessments in any part of its normative or descriptive corpus. Neither the main text nor the amendments introduce projections of lagoonal evolution, climate-driven transformations, or alternative trajectories for sediment dynamics, ecological change, or human uses. This omission positions the instrument within a static, deterministic tradition of spatial regulation, consistent with the rational-comprehensive model prevalent in Italian planning during the early 2000s, but increasingly misaligned with contemporary approaches that emphasise uncertainty, adaptive capacity, and long-term socio-ecological resilience (Haasnoot et al. 2013; Pérez-Soba, Maas 2015). From a scientific standpoint, the absence of anticipatory tools prevents the plan from grappling with the multiple, plausible futures inherent to lagoon systems, thereby limiting its capacity to guide transformative or climate-resilient decision-making. The result is a governance framework oriented toward the preservation of existing conditions and the mitigation of present pressures, rather than an instrument capable of preparing for, or strategically shaping, the complex and uncertain futures of the Venetian lagoon.

### 3.2.2 Outcome of the Analysis

The analysis highlights that the Piano per la Laguna e le Isole Minori does not incorporate more-than-human approaches, rights-of-nature principles, or relational socio-ecological frameworks. Its conceptual orientation remains anthropocentric, managerial, and oriented toward safeguarding environmental conditions primarily to maintain human uses, cultural landscapes, and heritage structures. While the plan contains measures that align superficially with contemporary notions of “living with nature”, these remain functional and instrumental rather than relational or ecocentric.

This assessment underscores the conceptual distance between legacy planning instruments and emerging frameworks in environmental humanities and ecological governance. It further suggests the need for renewed planning paradigms capable of engaging with socio-ecological entanglements and the complex, dynamic nature of the lagoonal system, including uncertain futures. Incorporating more-than-human perspectives, hydrosocial understandings of

water, and ecocentric legal principles could enhance future planning revisions, aligning them with contemporary scientific, cultural, and ethical debates on environmental governance and planetary futures. Given the rapid ecological and socio-environmental shifts affecting the lagoon, it is essential that the plan be regularly updated to incorporate new scientific knowledge, emerging risks, and evolving governance needs.

The analysis demonstrates that the Piano remains firmly rooted in an anthropocentric and managerial planning paradigm, treating the lagoon as an object of regulation rather than a relational socio-ecological partner. It lacks the conceptual, legal, and methodological orientations, more-than-human perspectives, rights-of-nature principles, hydrosocial understandings, and anticipatory scenario thinking that contemporary scholarship identifies as essential for governing dynamic coastal environments. As a result, the plan is structurally limited in its capacity to engage with the multispecies interdependencies, ecological uncertainties, and future transformations that define the Venetian lagoon in the twenty-first century.

Institutional planning measures remain constrained by outdated and often inconsistent approaches that prove rigid and ill-suited to the amphibious futures (Part 1), although planning tools are increasingly considering scenarios to map and plan uncertainty. However, new civic, bottom-up initiatives are beginning to articulate more relational and forward-looking frameworks. Notably, in October 2025, the Carta dei Diritti della Laguna (Charter of Rights for the Venice Lagoon, IDRA 2025)<sup>4</sup> made its first public appearance as part of Ecological Rights and ecosystemic approach for the construction of a new transcultural Eco-Legal Paradigm (Bagni, D'Andrea 2025). The initiative poses a provocative and necessary question: "Can a body of water hold rights?" Inspired by the pioneering example of the Mar Menor in Spain, the first European ecosystem to be granted legal rights, a broad network of associations and citizens has begun drafting a rights charter for the Venice Lagoon. The document was presented and discussed at the event *Verso una Carta dei Diritti per la Laguna di Venezia*, where scholars, activists, and practitioners, including representatives from wetlands, engaged critically with its preliminary formulation. Co-organized with the scientific support of THE NEW INSTITUTE Center for Environmental Humanities (NICHE, Ca' Foscari University of Venice) and the UNESCO Chair on Water, Heritage, and Sustainable Development, this effort signals an important shift: a move toward recognizing the lagoon not merely

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**4** "WATERSCAPES | Verso una Carta dei Diritti per la Laguna di Venezia". *CaFoscariNews*. <https://www.unive.it/data/16437/26/105631>.

as an environment to be managed but as a living entity embedded within social, cultural, and ecological rights frameworks.

The Charter for the Rights of the Lagoon, is an example of bottom up movement and is a civic initiative that embodies emerging forms of water citizenship, the moving dendrites of a Siphonophorae Society. As a collective effort bringing together different layers of society in a transgenerational and transdisciplinary way, it assembles a hundred-eyed perspective, much like the compound vision of siphonophores attuned to its viscous environment from multiple angles at once. In fact this is a broad yet situated approach, recognising interdependency and connectivity of land and water and asking citizens to take responsibility for land-sea interactions. It is important to note that this does not represent a complete shift from the concept of Ocean Citizenship, but rather an expansion that may favour citizen engagement by allowing them to recognise their participation in a large fluid dynamic, as the lagoon extends and meshes land and sea, salt and sweet waters.

#### **4 Conclusion**

The Lagoon, with its hundreds of beautiful, fragile, and porous depths, appears now like a Siphonophora holding its breath, its colonial body suspended between the capacity to adapt and the inability to do so.

Current planning instruments remain tethered and grounded to terrestrial paradigms, lacking the liquid, relational, and more-than-human vision required to navigate amphibious futures. Second, through the MOSE system, Venice relinquishes part of its amphibious condition, stepping back from centuries of embracing waters; here technological protection becomes a technocratic force, manoeuvred from above, that paradoxically alters and constrains the very hydrosocial system it seeks to defend. These tensions materialize ecologically as well: while the lagoon's biodiversity and fragile salt marshes face increasing pressure from disrupted sedimentation, tursiops (such as 'Mimmo') are rapidly transformed into touristic spectacles rather than recognized as fellow inhabitants, citizens of the lagoon's multispecies community.

Moreover, the lagoon's planning regulations remain anchored in an anthropocentric and extractivist logic, offering neither the relational, more-than-human, nor forward-looking frameworks needed to govern a dynamic and uncertain amphibious environment. In the same breath, alongside these contradictions, citizens and local groups continue to mobilise and fight for the lagoon's rights (Carta dei Diritti della Laguna 2025), advocating for governance frameworks that acknowledge its agency and vulnerability, making waves of change across civic dimensions of water citizenship and rights of nature.

Thus, in a lagoon perhaps predisposed to becoming a Siphonophorae Society: interconnected, distributed, interdependent, adaptive, we write toward watery futures that refuse separation and embrace reciprocity. In this sense, society is no longer defined by building against or on top of water, but by learning to live with(in) it. New forms of collective adaptation and amphibious public spaces emerge through strategies that expand public life and shared territories: floating squares, habitable piers, temporary platforms, submersible walkways, accessible floodplain forests, and navigable canals as new routes of connection. These amphibious devices are not just technical infrastructures, but social tools that foster accessibility, interaction, and new forms of community, creating spaces where people can gather, collaborate, and reimagine their relationship with water.

As citizens of the lagoon, as zooids within a larger collective organism, we are called to work toward the vitality of the collective organism and system: floating through amphibious territories and futures, cultivating ways of living that move with water, protect the integrity of amphibious ecologies, and sustain the relational vitality of the Hydrocene.

## Bibliography

- Adger, W. (2000). "Social and Ecological Resilience: Are They Related?". *Progress in Human Geography*, 24(3), 347-64. <https://doi.org/10.1191/030913200701540465>.
- Alaimo, S. (2025). *The Abyss Stares Back: Encounters with Deep-Sea Life*. Minneapolis: University of Minnesota Press.
- Arnold, R.D.; Wade, J.P. (2015). "A Definition of Systems Thinking: A Systems Approach". *Procedia Computer Science*, 44, 669-78. <https://doi.org/10.1016/j.procs.2015.03.050>.
- Artioli, L.; Soffietti, F.; Fagnoni, R.; Sinni, G.; De Martino, P.; Musco, F. (2025). "Designing with an Ocean Literacy Approach: Towards the Definition of 'Ocean Cycle-Centric Design'". *Ocean and Society*, 2, 9725. <https://doi.org/10.17645/oas.9725>.
- Åsberg, C.; Braidotti, R. (eds) (2018). *A Feminist Companion to the Posthumanities*. Cham: Springer.
- Bagni, S.; D'Andrea, A. (2025). "Dichiarazione dei Diritti della Laguna Veneta e delle Responsabilità dei suoi Abitanti e Fruitore". *Blog del progetto LUMEN, Alma mater studiorum – Università di Bologna*, 30 ottobre. <https://site.unibo.it/lumen/it/notizie/dichiarazione-dei-diritti-della-laguna-veneta-e-delle-responsabilita-dei-suoi-abitanti-e-fruitori>.
- Bailey-Charteris, B. (2024). *The Hydrocene: Eco-Aesthetics in the Age of Water*. London: Routledge.
- Bartlett, C.; Marshall, M.; Marshall, A. (2012). "Two-Eyed Seeing and Other Lessons Learned within a Co-Learning Journey of Bringing Together Indigenous and Mainstream Knowledges and Ways of Knowing". *Journal of Environmental Studies and Sciences*, 2(4), 331-40. <https://doi.org/10.1007/s13412-012-0086-8>.
- Bauman, Z. (2007). *Liquid Times: Living in an Age of Uncertainty*. Cambridge: Polity Press.

- Berkowitz, H.; Crowder, L.B.; Brooks, C.M. (2020). "Organizational Perspectives on Sustainable Ocean Governance: A Multi-Stakeholder, Meta-Organization Model of Collective Action". *Marine Policy*, 118, 104026. <https://doi.org/10.1016/j.marpol.2020.104026>.
- Bolender, K. (2015). *The Unstable Condition of Bodies and Water*. Brooklyn: Punctum Books.
- Boteler, B.; Durussel, C. (2022). *Applying a Participative Multi-Stakeholder Approach in Transdisciplinary Ocean Governance Research: Reflections from the STRONG High Seas Project*. STRONG High Seas Project.
- Brennan, C.; Ashley, M.; Molloy, O. (2019). "A System Dynamics Approach to Increasing Ocean Literacy". *Frontiers in Marine Science*, 6, 360. <https://doi.org/10.3389/fmars.2019.00360>.
- Buchan, P.M.; Evans, L.S.; Pieraccini, M.; Barr, S. (2023). "Marine Citizenship: The Right to Participate in the Transformation of the Human-Ocean Relationship for Sustainability". *PLoS One*, 18(3), e0280518. <https://doi.org/10.1371/journal.pone.0280518>.
- Budds, J. (2008). "Whose Scarcity? The Hydrosocial Cycle and the Changing Waterscape of La Ligua River Basin, Chile". *The Geographical Journal*, 178(3), 236-47.
- Caretta, M.A.; Côte, M.; Ramasar, V.; Nair van Ryneveld, T.; Zaragocin, S. (2024). "Resistance to Extractivism-Induced Water Insecurity: Does Gender Have a Role in It? A Systematic Scoping Review". *Geography Compass*, 18, e12767. <https://doi.org/10.1111/gec3.12767>.
- Castro, A.J.; Vaughn, C.C.; Julian, J.P.; García-Llorente, M. (2016). "Social Demand for Ecosystem Services and Implications for Watershed Management". *JAWRA Journal of the American Water Resources Association*, 52(1), 209-21. <https://doi.org/10.1111/1752-1688.12379>.
- Cibic, T.; Baldassarre, L.; Auriemma, R.; Balestra, C.; Banchi, E.; Battaggia, G.; Bazzaro, M.; Cerino, F.; De Pascale, F.; Diociaiuti, T.; Guarneri, I.; Kralj, M.; Malfatti, F.; Manna, V.; Natali, V.; Nasi, F.; Relitti, F.; Vezzi, A.; Tagliapietra, D. (2025). "Effects of the Mobile Gates (MOSE) Closure on the Ecosystem Functioning of the Venice Lagoon: An Experimental Assessment with Enclosures". *Frontiers in Marine Science*, 12, 1675001. <https://doi.org/10.3389/fmars.2025.1675001>.
- De Martino, P.; Ferraioli, E.; Maragno, D.; Musco, F. (2026). "Living with Water: Toward an Amphibious Planning Paradigm for Multi-Risk Territories". *Contesti. Città, Territori, Progetti*, 156-79. <https://doi.org/10.36253/contest-16564>.
- Depledge, M.H. (2024). "Re-Thinking Human Interactions with the Oceans". *R Soc Open Sci*, 11(10), 240808. <https://doi.org/10.1098/rsos.240808>.
- Dipartimento di Geoscienze, Università di Padova (s.d.). *The Barriers of MOSE Protect Venice but the System Has Negative Impacts on Salt Marshes and on the Lagoon Morphology, a New Study Shows*. <https://www.geoscienze.unipd.it/en/barriers-mose-protect-venice-system-has-negative-impacts-salt-marshes-and-lagoon-morphology-new-0>.
- Engelmann, S.; Alarcón, D.; Islar, M.; Ozkul, D. (2022). "Hydrofeminist Political Ecologies: Water, Power, and Care in More-Than-Human Worlds". *Environment and Planning E: Nature and Space*, 5(4), 1785-803.
- Eschscholtz, F. (1829). *System der Acalephen. Eine ausführliche Beschreibung aller medusenartigen Strahltiere*. Berlin: Ferdinand Dümmler. <https://www.biodiversitylibrary.org/page/10665047>.
- Fagnoni, R. (2022). "Civic Space Design: Interazioni urbane". Lessing, E.; Bosco, A.; Calogero, L.; Dalla Mura, E. (a cura di), *Interior/Design: Espandere il campo*. Dueville: Ronzani Editore, 95-104.

- Giaccardi, E.; Murray-Rust, D.; Redström, J.; Caramiaux, B. (2024). "Prototyping with Uncertainties: Data, Algorithms, and Research Through Design". *ACM Transactions on Computer-Human Interaction*, 31(6), 1-21. <https://doi.org/10.1145/3702322>.
- Giaccardi, E.; Redström, J.; Nicenboim, I. (2024). "The Making(s) of More-Than-Human Design: Introduction to the Special Issue on More-Than-Human Design and HCI". *Human-Computer Interaction*, 1-16. <https://doi.org/10.1080/07370024.2024.2353357>.
- Glithero, L.D.; Bridge, N. et al. (2024). *Ocean Decade Vision 2030 White Papers – Challenge 10: Restoring Society's Relationship with the Ocean*. Paris: UNESCO-IOC. <https://doi.org/10.25607/EKWN-WH61>.
- Haas, B.; Mackay, M.; Novaglio, C. et al. (2022). "The Future of Ocean Governance". *Rev Fish Biol Fisheries*, 32, 253-70. <https://doi.org/10.1007/s11160-020-09631-x>.
- Haasnoot, M.; Kwakkel, J.H.; Walker, W.E.; Ter Maat, J. (2013). "Dynamic Adaptive Policy Pathways: A Method for Crafting Robust Decisions for a Deeply Uncertain World". *Global Environmental Change*, 23(2), 485-98. <https://doi.org/10.1016/j.gloenvcha.2012.12.006>.
- Haraway, D.J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Durham: Duke University Press.
- Head, L. (2016). *Hope and Grief in the Anthropocene: Re-Conceptualising Human-Nature Relations*. London: Routledge.
- Houston, D.; Hillier, J.; MacCallum, D.; Steele, W.; Byrne, J. (2018). "Make Kin, Not Cities! Multispecies Entanglements and 'Becoming-World' in Planning Theory". *Planning Theory*. <https://doi.org/10.1177/1473095216688042>.
- IPCC (Intergovernmental Panel on Climate Change)(2022). *Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press.
- Jefferson, R.; McKinley, E.; Griffin, H.; Nimmo, A.; Fletcher, S. (2021). "Public Perceptions of the Ocean: Lessons for Marine Conservation from a Global Research Review". *Frontiers in Marine Science*, 8. <https://doi.org/10.3389/fmars.2021.711245>.
- Jue, M. (2020). *Wild Blue Media: Thinking Through Seawater*. Durham: Duke University Press.
- Kauffman, C.M.; Martin, P.L. (2017). "Can Rights of Nature Make Development More Sustainable? Why Some Ecuadorian Lawsuits Succeed and Others Fail". *World Development*, 92, 130-42. <https://doi.org/10.1016/j.worlddev.2016.11.017>.
- Kluitenberg, E. (2006). "The Network of Waves: Living and Acting in a Hybrid Space". Seijdel, J. (ed.), *Open: Hybrid Space, How Wireless Media Mobilise Public Space*, no. 11. Rotterdam: NAI Publishers, 6-16.
- Krause, F. (2017). "Amphibious Living: Water and the Politics of Dwelling on the Lower Rhine". *Anthropology Today*, 33(6), 17-20.
- Krause, F. (2019). "Dwelling in Flux: Living with Rivers in the Rhine Delta". Harvey, G.; Jones, P. (eds), *River Cultures: Living with Rivers in the Anthropocene*. London: Routledge.
- Krause, F.; Strang, V. (2016). "Thinking Relationships Through Water". *Society & Natural Resources*, 29(6), 633-8. <https://doi.org/10.1080/08941920.2016.1151714>.
- Leventon, J.; Abson, D.J.; Lang, D.J. (2021). "Leverage Points for Sustainability Transformations: Nine Guiding Questions for Sustainability Science and Practice". *Sustain Sci*, 16, 721-6. <https://doi.org/10.1007/s11625-021-00961-8>.

- Linton, J.; Budds, J. (2014). "The Hydrosocial Cycle: Defining and Mobilizing a Relational-Dialectical Approach to Water". *Geoforum*, 57, 170-80. <https://doi.org/10.1016/j.geoforum.2013.10.008>.
- Lizarralde, G. et al. (2025). "Beyond Fear: The Role of Emotions in Disaster Risk Reduction in the Face of Climate Change". *Emotion, Space and Society*, 54, 101054. <https://doi.org/10.1016/j.emospa.2024.101054>.
- Lovelock, J.E.; Margulis, L. (1974). "Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis". *Tellus A*, 26(1-2), 2-10.
- Mackie, G.O.; Pugh, P.R.; Purcell, J.E. (1988). "Siphonophore Biology". *Advances in Marine Biology*, vol. 23. London: Academic Press, 1-97. [https://doi.org/10.1016/S0065-2881\(08\)60074-7](https://doi.org/10.1016/S0065-2881(08)60074-7).
- Macpherson, E.; Clark, C.; Weber Salazar, P.; Baird, N.; Akhtar-Khavari, A.; Challies, E. (2023). "Evolving Rights to (and of) Water in Chile: A Case for Relationship-Based Water Law and Governance". *The International Journal of Human Rights*. <https://doi.org/10.1080/13642987.2023.2266719>.
- Macpherson, E.; Guzmán, B.; Prieto, M. (2023). "Relational Water Governance and Indigenous Authority in Chile". *Water Alternatives*, 16(2), 233-56.
- Mapstone, G.M. (2014). "Global Diversity and Review of Siphonophorae (Cnidaria: Hydrozoa)". *PLOS ONE*, 9(2), e87737. <https://doi.org/10.1371/journal.pone.0087737>.
- Morita, T. (2016). "Multispecies Entanglements in a Deltaic World: Amphibious Anthropology in Practice". *Cultural Anthropology*, 31(4), 472-98.
- Næss, A. (1973). "The Shallow and the Deep, Long-Range Ecology Movement: A Summary". *Inquiry*, 16(1-4), 95-100. <https://doi.org/10.1080/00201747308601682>.
- Neimanis, A. (2012). "Hydrofeminism: Or, Becoming a Body of Water". Åsberg, C.; Hird, C.; Lee, M. (eds), *Thinking with Water*. Montreal: McGill-Queen's University Press, 85-100.
- Neimanis, A. (2017). *Bodies of Water: Posthuman Feminist Phenomenology*. London: Bloomsbury.
- Neimanis, A.; Walker, R.L. (2014). "Weathering: Climate Change and the Thick Time of Transcorporeality". *Hypatia*, 29(3), 558-75.
- Nicolaidis Lindqvist, A.; Fornell, R.; Prade, T.; Khalil, S.; Tufvesson, L.; Kopainsky, B. (2022). "Impacts of Future Climate on Local Water Supply and Demand – A Socio-Hydrological Case Study in the Nordic Region". *Journal of Hydrology: Regional Studies*, 41, 101066. <https://doi.org/10.1016/j.ejrh.2022.101066>.
- O'Donnell, E.; Clark, C.; Killeen, R. (2024). "Rights and Relativity: A Review of the Role of Law in the Human/Water Relationship". *Water Alternatives*, 17(2), 207-38.
- OECD (Organisation for Economic Co-operation and Development) (2016). *Water Risk Hotspots for Agriculture*. Paris: OECD Publishing.
- Omodeo, P.D.; Consolandi, P. (eds) (2025). *The Anthropocene Waterscapes of Venice*. Venice: Edizioni Ca' Foscari.
- Overbeek, B.; Bessembinder, J. (2013). "Autumn School: 'Dealing with Uncertainties in Research for Climate Adaptation'". Paper presented at *Impacts World 2013: International Conference on Climate Change Effects* (Potsdam, 2013).
- Pérez-Soba, M.; Maas, R. (2015). "Scenarios: Tools for Coping with Complexity and Future Uncertainty?". Jordan, A.J.; Turnpenny, J.R. (eds), *The Tools of Policy Formulation*. Cheltenham: Edward Elgar, 52-75. <https://doi.org/10.4337/9781783477043.00014>.
- Peters, K.; Steinberg, P. (2019). "The Ocean in Excess: Towards a More-Than-Wet Ontology". *Dialogues in Human Geography*, 9(3), 293-307. <https://doi.org/10.1177/2043820619872886>.

- Rupprecht, C.D.D.; Vervoort, J.; Berthelsen, C.; Mangnus, A.; Osborne, N.; Thompson, K.; Urushima, A.Y.F.; Kóvskaya, M.; Spiegelberg, M.; Cristiano, S.; Springett, J.; Kawai, A. (2020). "Multispecies Sustainability". *Global Sustainability*, 3, e34. <https://doi.org/10.1017/sus.2020.28>.
- Scott, J.C. (1998). *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press.
- Squarcina, E.; Pecorelli, V. (2017). "Ocean Citizenship. The Time to Adopt a Useful Concept for Environmental Teaching and Citizenship Education Is Now". *J-Reading – Journal of Research and Didactics in Geography*, 2/2017, 45-53.
- Steinberg, P.; Peters, K. (2015). "Wet Ontology: Making Sense of Liquid Life". *Water Worlds: Human Geographies of the Ocean*. London: Routledge, 1-19.
- Tognin, D.; D'Alpaos, A.; Marani, M.; Carniello, L. (2021). "Marsh Resilience to Sea-Level Rise Reduced by Storm-Surge Barriers in the Venice Lagoon". *Nature Geoscience*, 14(12), 906-11. <https://doi.org/10.1038/s41561-021-00853-7>.
- Tognin, D.; Finotello, A.; D'Alpaos, A.; Viero, D.P.; Pivato, M.; Mel, R.A.; Defina, A.; Bertuzzo, E.; Marani, M.; Carniello, L. (2022). "Loss of Geomorphic Diversity in Shallow Tidal Embayments Promoted by Storm-Surge Barriers". *Science Advances*, 8(13), eabm8446. <https://doi.org/10.1126/sciadv.abm8446>.
- Tompkins, E.L.; Few, R.; Brown, K. (2008). "Scenario-Based Stakeholder Engagement: Incorporating Stakeholders Preferences into Coastal Planning for Climate Change". *Journal of Environmental Management*, 88(4), 1580-92. <https://doi.org/10.1016/j.jenvman.2007.07.025>.
- Tsing, A.L.; Swanson, H.A.; Gan, E.; Bubandt, N. (eds) (2017). *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*. Minneapolis: University of Minnesota Press. <https://doi.org/10.4000/miranda.11648>.
- UNDRR (United Nations Office for Disaster Risk Reduction) (2020). *The Human Cost of Disasters: An Overview of the Last 20 Years (2000-2019)*.
- UNESCO (United Nations Educational, Scientific and Cultural Organization); UN-WWDR (United Nations World Water Development Report) (2024). *United Nations World Water Development Report 2024*. Paris: UNESCO.
- Vervoort, J.M.; Kok, K.; van Lammeren, R.; Veldkamp, T. (2010). "Stepping into Futures: Exploring the Potential of Interactive Media for Participatory Scenarios on Social-Ecological Systems". *Futures*, 42(6), 604-16. <https://doi.org/10.1016/j.futures.2010.04.031>.
- Vignozzi, A. (1994). "Design Control in Italian Planning". *Built Environment*, 20(2), 127-41. <http://www.jstor.org/stable/23287580>.
- Weiland, L.; Unger, S.; Rochette, J.; Müller, A.; Neumann, B. (2021). "Advancing Ocean Governance in Marine Regions Through Stakeholder Dialogue Processes". *Frontiers in Marine Science*, 8, 645576. <https://doi.org/10.3389/fmars.2021.645576>.
- Whatmore, S.J. (2006). "Materialist Returns: Practising Cultural Geography in and for a More-Than-Human World". *Cultural Geographies*, 13(4), 600-9.
- Whittaker, G.R.; Peters, K.; van Opzeeland, I. (2025). "Narrators of Submersive Affective Atmospheres: Analysing Oceanic Representations Through Narratives of Sound". *Emotion, Space and Society*, 55, 101067. <https://doi.org/10.1016/j.emospa.2025.101067>.
- Willow, A. (2016). "Troubling Water: Shale Energy and Waterscape Transformation in a North American Extraction Zone". *Anthropologica*, 58, 166-78. <https://doi.org/10.3138/anth.582.T01>.
- WMO (World Meteorological Organization) (2023). *State of Global Water Resources Report 2023*.
- Zylinska, J. (2014). *Minimal Ethics for the Anthropocene*. London: Open Humanities Press.

