



# Predicting Future Oceans

Sustainability of Ocean and Human Systems  
Amidst Global Environmental Change

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# *The last commons: (re)constructing an ocean future*

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## **35.1 Introduction**

Recent research on the global ocean has emphasized diverse, dramatic, and largely ominous shifts in the ways that oceans function as a socionatural system. Frequently cited studies indicate that global fish stocks are generally in decline, with 90% of assessed commercial stocks fully or overfished [1]. Other research suggests that due to this systematic and long-term overharvesting, as well as pollution, habitat loss, and other anthropogenic stressors, marine biodiversity in general is in decline [2,3]. Still more research indicates that global environmental drivers like climate change will lead to ocean warming, sea level rise, ocean acidification, increased storm intensity, ecosystem simplification and degradation, and overall unparalleled disruptions to the biophysical properties of most major oceans [4–7]. Attending these alarming findings in marine systems are further projections of their effects on human and coupled socionatural systems. Recent literature has tied degradation of marine systems to such diverse social outcomes as food security and food sovereignty [8–11], loss of livelihoods [12,13], conflict [14,15], and human rights abuses [16,17].

While all of this research provides a critical body of evidence for understanding what “future ocean” we will experience, the future of nature–society relations is ultimately about shaping *human* systems and behaviors [18,19]. One of the fundamental ways in which these relations are shaped and mediated is through the notion of property; as Mansfield states, “property has become the central mode of regulating multiple forms of nature” [20]. Property, understood not as an object itself, but as a social relation, is often defined as “a claim that will be enforced by society or the state, by custom or convention or law. . . Property is a political relation between persons” [21]. As such, it is clear that neither space (e.g., the sea) nor resources (e.g., fish) are themselves intrinsically “property,” but become such through their articulation in the nature–society relationship through the conferring of rights.

The last several decades have seen notable changes in the ways that we think about ocean spaces and resources. New property regimes have come into play, accompanied by novel institutions and modes of governance, with considerable consequences for individuals, communities, and political and economic systems. Despite the early dominance of diverse oceanic property arrangements (e.g., open access, communal, individual, state, etc.), a growing body of evidence suggests that property configurations at sea are increasingly resembling the established neoliberal political economic relations seen on land, including the enclosure, privatization, commodification, and marketization of previously untargeted forms of “natural capital” [22–25]. Well-developed literatures in agrarian political economy, political ecology, critical physical geography, and environmental governance have demonstrated that these neoliberal configurations have in many cases resulted in increasing resource disparities, concentrations of wealth, and the dispossession of poor and marginalized individuals and groups [26].

In this chapter we identify historical trends in the enclosure of ocean spaces and resources, how these enclosures emerged, and the discourses that have facilitated their expansion. We contrast the original goals and expectations of actors in creating these enclosures with the reality of their consequences in practice, highlighting some of the outcomes for developing countries and marginalized actors. We then briefly explore two trends in contemporary marine enclosure, focusing on the role of privatization in both the nature of enclosure and its social consequences. Finally, we conclude by contrasting two possible “future oceans”: one brought forth from continued support for neoliberal approaches to managing our relationship with the sea, and an alternate future, in which we purposefully reshape nature–society relations with the sea around goals of equity and empowerment.

### ***35.2 “The largest single enclosure in history”: a changing ocean regime***

As “projects associated with territory making and unmaking,” efforts to define property in seaspace have occurred for millennia [27–29]. However, most of these efforts remained

localized and relatively small in scale until the 16th and early 17th centuries, when expanding maritime claims from multiple European powers prompted the juridical debates now considered the foundation of modern property relations at sea [27,28,30]. This debate emerged at a time of conflicting state practice wherein some states (e.g., England, Spain, Portugal) sought to promote their interests through increased appropriation of resources and control of seaspaces, whereas others (e.g., Netherlands) supported open access to enhance freedom of navigation and capitalist trade [27,30]. As contemporary publicists sought to engender support for these divergent causes, the debate became characterized by two opposing views. *Mare liberum*, or “freedom of the seas,” championed by Hugo Grotius, asserted that oceans cannot be appropriated because of their abundance and because they cannot be occupied, as “all property has arisen from occupation” [31]. In contrast, *mare clausum*, or “closed seas,” attributed to John Selden, claimed that state practices of maritime enclosure and control were not only legitimate, but long-standing [32]. While the Grotian view of ocean property came to dominance, this perspective prevailed not simply on its theoretical superiority, but because of the specific limitations of these claims at the time. As a social relation, property is comprised of both the assertion of property by the rights holder (this is mine) and the concession as property from those without rights (I agree to act as though that is yours) [20,33,34]. Friedheim and others suggest that these state claims to ocean enclosure in the 17th century failed precisely because of (1) the limited capacity of states to actually control activity within the claimed spaces, and (2) the rejection of the claims on the part of other state actors [30,34]. The ocean, commonly perceived at the time as unoccupied, unbounded, limitless, and abundant, neither necessitated nor lent itself to the notion of enclosure [34,35].

This *mare liberum* perspective prevailed until the mid-20th century, when several changes shifted these dominant conditions and discourses. First, rapid changes in vessel and surveillance technology fundamentally changed states’ perceptions of their ability to appropriate and control ocean spaces [34,36]. Accompanying this change was a similar shift in the overall acceptability of maritime enclosure [30,37]. Finally, in addition to the newly perceived *ability* of states to control ocean territories, global environmental and economic discourse began to suggest the *necessity* of this enclosure. Legal theorists had for centuries debated the seas as either *res nullius* (property of no one, e.g., “open access”), or *res communis* (common possession, e.g., “common heritage”) [34], understood as the difference between “open access” resources under no property arrangement versus commonly managed resources under communal property arrangements [18,38]. In the 20th century this debate shifted almost entirely to discourses of ocean resources as “open access,” not only susceptible to overexploitation in terms of Hardin’s Tragedy of the Commons [39], but also at risk of losing their economic potential, just as states came to perceive them as capable of exclusive exploitation [36]. This framing of oceans and their wealth as “open access”—inevitably culminating in overexploitation and depletion—produced a necessity for closed

access, or the introduction of property rights to secure potential economic investment and ensure sustainability [18,20,25,40].

These emerging discourses presupposed a need for property rights that remains strong today. This necessity was gradually realized through a series of international and national policy shifts that culminated in the UN Convention on the Law of the Sea (UNCLOS). Under UNCLOS, sovereign rights to the resources of the continental shelf and exclusive economic zone (EEZ) extending 200 nm were granted to the coastal state, in an act which has been called “the largest single enclosure in history” [27]. This shift toward granting sovereign rights to states, where they had never previously existed, resulted in both expected and unanticipated consequences, explored in the following section.

### ***35.3 Sustainable efficiency or inequitable dispossession: tracing the legacies of neoliberal enclosure***

The material consequences of the property regime shift from the “property of no one” to state property were substantial. With the establishment of UNCLOS, in a single act, 36% of the world's ocean surface, more than a third of its seabed, and 90% of its fisheries resources were enclosed as state property [36,41,42]. However, these material consequences also engendered significant discursive and normative consequences, and Alcock states that “few seem to fully appreciate the ongoing evolution in property rights systems that has been triggered by this change” [36]. The shift in ocean wealth to individual state property created, for the first time, the potential for states to extract ground rent, or the right to charge fees for access to the space and resources within its EEZ [27]. Prevailing fisheries economics and property theories at the time suggested that this conferral of rights and responsibilities would result in increased investments in sustainability and maximization of resource benefits [43,44]. However, as diverse scholars have demonstrated, instead of increasing stewardship and improving the welfare of citizens, the shift to state control largely engendered a series of neoliberal incentives of maximizing profits. Indeed, many have argued that this shift to state control was only a necessary precondition for a more complete shift toward the “perfect right,” a private right [45]. Friedheim states that “from the earliest discussions of what analysts hoped UNCLOS III might accomplish, the idea was to enclose as much space and resources as possible to designated stakeholders with exclusive rights of access. . . The hope of some of them was to take it a step further and use state power to privatize ownership or access rights” [41,46]. What followed were substantial projects of industrialization, capitalization, and subsidization that, rather than protect local resources and resource users, frequently jeopardized traditional institutions and practices, increased overall resource exploitation, and introduced new industrial actors into previously isolated spaces [36].

Many of the social costs of enclosure and privatization observed for hundreds of years in terrestrial systems (e.g., agricultural, pastoral, forest) have recently been noted in marine systems. These studies illustrate that while private property rights may increase investment and security for those with rights, they are often accompanied by processes of violence and dispossession for those for whom rights are withheld [20]. Instead of the platitude that “a high tide raises all boats,” a substantial body of research suggests that the creation of private property rights often increases disparities and concentrates wealth [47,48]. Within marine systems, the introduction of private property has been shown in multiple cases to increasingly marginalize traditional and small-scale fishers [23,49], women [50], developing countries and small island developing states, and indigenous peoples [51]. Two cases in marine fisheries and “blue growth” industries below illustrate the pervasiveness of contemporary marine enclosure and the growing awareness of their social impacts. Here we focus briefly on the increasing role of privatization in reconfiguring the power and access dynamics behind current marine property distribution, resource use, and governance decision-making. Each case highlights similarities in socioeconomic outcomes for less powerful and more resource-dependent actors, and paints a concerning picture for the future of equitable resource use in the world’s oceans.

### ***35.3.1 The rise of individual transferable quotas and privatization of a public good***

In the mid-20th century, following the rise of EEZs and rights-based fisheries discourses, many states set about privatizing fishing rights within their waters by creating and sustaining market-based mechanisms that commodified, limited, and controlled resource access to this previously public good [25,52]. A popular privatizing mechanism for “securing” fishing rights was the individual transferable quota (ITQ). ITQs are a type of catch share whereby the regulator (i.e., government) sets a total allowable catch over a period of time and allocates shares of this quota to private entities who may then purchase, sell, or lease them depending on the set conditions. ITQs, and variants thereof, were widely promoted and implemented in the global north from the 1970s into the 1990s in countries like Canada, the United States, Iceland, and New Zealand [52]. The presumed ability of ITQs to usher in a new era of responsible ocean stewardship was twofold. First, individuals or groups allocated the right to fish would, as rational and economically-driven entities, be predisposed to conserve their exclusive property right in order to fish for profit in perpetuity. Second, the efficiency of markets would address worldwide overfishing by tackling excess capacity. Such markets could “weed out” less efficient fishers and incentivize them to sell their rights to more efficient fishers before voluntarily exiting the fishery.

The ultimate effect of ITQ policies on fisheries sustainability around the world is the subject of debate. Many economists assert that such schemes did reduce overcapitalization,

increase operational efficiency, and facilitate long-term planning (e.g., [36,45,53,54]). However, others find no compelling evidence that property rights schemes like ITQs create resource conservation incentives [55], or are even primarily oriented towards resource protection [56]. What are increasingly clear are the well-documented negative social effects that ITQ schemes have facilitated through the consolidation of resource use rights.

By their very nature ITQ programs prioritize economic values, subjugating other possible social and cultural values into “trade-offs” to achieve economic efficiency. However, this operational model fails to consider the more sociocultural ethic of many small-scale fishery (SSF) actors and interests [55]. As such, the negative distributive impacts of ITQ schemes has often fallen most heavily onto “inefficient” and “irrational” indigenous and small-scale resource users whose operational priorities may incorporate more of a balance of values. These groups are also typically highly reliant on fisheries for their livelihoods and often unable to compete for fishery benefits with the wealthier and capital-rich entities operating within ITQ regimes [25,52,55].

A brief review of the history of ITQ fisheries in Canada, the United States, and New Zealand illustrates the common occurrence of private corporate interests becoming majority owners of ITQ fisheries through state-supported consolidation of quota ownership and vertical integration [25,47,49,51,57]. This power was subsequently exercised to dictate new terms for allocating fishing rights in state-owned waters: in some cases consolidated catch shares were leased by private entities back to less powerful SSF actors at wildly inflated prices; in others local actors were excluded entirely as the right to fish was sold to foreign interests [47,48]. This pattern of corporate consolidation and exclusion, and the negative impacts on indigenous and SSF communities, was sufficiently consistent and acute that some states eventually intervened in ITQ markets by placing limits on transferability and consolidation or by implementing ITQ moratoriums [25,47,57]. While many of these ITQ fisheries still exist in some form today, in many cases this has come at great sociocultural cost. In British Columbia, Canada, for example, the historic coastal salmon canning industry permanently collapsed as the majority corporate owner sent fish to be processed more cheaply abroad [55, p. 4]. Beyond the impacts of power consolidation on the ability of smaller actors to participate in their traditional fisheries, is the disruption and even illicitization of traditional cultural values and practices in some fisheries following the implementation of ITQ schemes [49,51]. For example, in Alaska, the high financial cost of staying in ITQ fisheries eroded crew and kin-based traditions around operational and capital succession and exacerbated existing class divisions between those with and without external financial backing [49]. BC halibut and salmon fisheries witnessed a new focus on wealth accumulation by boat owners at the expense of crew wages and other benefits [52]. Many indigenous Māori fishermen today find themselves structurally excluded from fishing, processing, or selling despite owning a significant portion of fishing quota in New Zealand [51].

ITQ's operationalize the privatization and marketization of the right to fish. That this act is promoted by the state as being "for the public good" is paradoxical given that this championing of exclusivity must necessarily emphasize the rights of some at the expense of others. As Mansfield [25, p. 323] notes: "all of the forms [of privatization] entail reducing the options of those who once relied on public fisheries, while giving to those who qualify a form of wealth that can then be used for further gain." The continued focus on economic efficiency as the primary determinant of "rationality," and of a fishery's inherent or even sole value, ensures that even the most thoughtfully designed ITQs will continue to favor profit-driven actors and interests and deliver unclear outcomes for all other values inherent within a fishery.

### ***35.3.2 Marine protected areas: the social cost of enclosing the ocean to save it***

The lead up to and adoption of the intergovernmental Convention of Biological Diversity in 1992 ushered in a new era of state-led commons enclosure in the name of biodiversity protection and conservation. While considerable attention has been paid to the subsequent patterns of privatization, dispossession, appropriation, and power capture that have accompanied the designation of terrestrial parks around the world (e.g., [57,58,59,60]), literature documenting similar trends in marine spaces is only more recently emerging (e.g., [61,62,63]). This growing focus on the similarities in sociocultural impacts of conservation-oriented marine and coastal enclosure comes at a time of renewed state interest in meeting global biodiversity conservation policy commitments.

With the approval of the Aichi biodiversity targets in 2010, nearly 200 states agreed to collectively "set aside" 10% of coastal and marine areas for protection worldwide [64]. Some scholars argue that these targets have provided a rationale and justification for states to enclose common property into a growing number of restricted marine protected areas (MPA) in "local" spaces, sometimes without local consultation [65,66]. Examples from Honduras, Kenya, Madagascar, Malaysia, Tanzania, and the Indian Ocean illustrate that the "designation" of marine conservation spaces, regardless of the intent, is inherently a form of "primitive accumulation" that converts public property into private property, dispossesses previous custodians of the right to use ocean spaces and freely access the benefits therein, and redirects the balance of power and capital accumulation away from local communities and marginalized groups (e.g., women, fishers) toward more powerful actors [61,62,63,66]. As Benjamin and Bryceson note, the majority of these actors include "rent-seeking state officials, transnational conservation organizations, tourism operators, and the state" [61]. The similarities noted between recent marine conservation enclosure and capital accumulation trends, and land-based "green grabs," has given rise to the term "blue" or "ocean" grabbing [67].

Small-scale coastal fishing communities in particular have borne much of the social brunt of marine biodiversity conservation initiatives, with women often the most affected. Echoing similar arguments against “irrational” “open access” fishing used to justify enclosure in state-owned waters with ITQs, narratives of “overfishing” and resource degradation have been used to justify the implementation of marine protected areas in countries such as Malaysia, Tanzania, and Madagascar [61,62,66]. MPAs in these (and other) countries have effectively provided the framework to restrict or entirely exclude traditional SSF through the use of mechanisms such as no-take zones, gear restrictions, and fenced-off areas that are endorsed not just by the state, but sometimes by coastal communities themselves. Often this dispossession is accompanied by promises of alternative opportunities with profit-oriented and privately-controlled marine “ecotourism” that may or may not be realized [61,63,66]. In essence, MPAs exclude SSF from the ability to derive benefits from the same state-owned natural resources that contribute to capital accumulation by tourist operators and indirectly the state itself (xx).

By demonstrating that conservation priorities have often outweighed sociocultural considerations, we do not suggest that conservation is not normatively “good” or that conservation cannot also bring social, economic, or environmental benefits [66,68]. Nor do we suggest that the historic practices of coastal communities are ideal, benign, or inclusive. What we, and other emerging scholarly works suggest is that marine conservation often has a very real human impact, and that more needs to be done by policy makers to acknowledge and understand the implications of implementing fundamentally exclusionary enclosures within marine areas.

### **35.4 *Choosing a future ocean***

In this chapter, we have presented a series of recent trends in the enclosure and privatization of ocean spaces and resources. We have discussed the material, discursive, and normative effects that these ocean property regimes shifts have had, and highlighted the asymmetrical consequences for particular individuals and communities. The final task is to consider a “future ocean” based on a critical analysis of this recent history.

In a business as usual scenario, our future ocean would look much like our terrestrial past; based on colonial histories, it would align with currently observed neoliberal principles of commodification, privatization, and marketization of ocean spaces and resources. Reflecting familiar trends in terrestrial resources from mining, agriculture, and forestry, this neoliberal ocean future predicts the concentration of ocean resource wealth into the hands of more privileged actors with the power, influence, and capital to maximize “efficient” economic use. Consequently, this *neoliberal ocean future* presages growing resource disparities, whereby those with privileged or exclusive access are able to derive increasing wealth from marine systems, while those lacking rights will see access to diverse benefits (e.g., nutrition,

employment, etc.) diminished. This growing emphasis on efficiency, privatization, and exclusive rights will further weaken traditional claims to ocean spaces and uses, pushing noneconomic values and practices to the margins or condemning them as illicit activities.

In contrast, we suggest an *alternate ocean future* whereby scholars, practitioners, policy makers, and user groups purposefully shape nature–society relations with the sea around goals of equity and empowerment. As stated above there is no property relation nor management system that is objective and ideal, without emphasizing certain values and actors over others. The neoliberal ocean future stresses privatization and profit maximization, accounting for other noneconomic values by way of trade-offs and sacrifices in economic efficiency. However, just because this approach is dominant does not mean it is inevitable or unchangeable. Other diverse principles besides economic efficiency have shaped natural resource rights and responsibilities, and many are based on principles of equity and distributional justice (e.g., allocating rights based on resource dependence, development status, or cultural significance). These principles occur not just in small coastal villages and towns, but also within global resource regimes that seek to acknowledge the consequences of neoliberal policies and reclaim the diverse benefits obtained from the sea. Many of these natural resource regimes actively seek to recover the benefits of communal management, essentially reasserting these resources as *res communis*. There is no way to exploit finite marine resources without making judgments about when, and by whom, resources should be used. However, it is possible to make those judgments explicit and reflective of chosen values around resource equity, rather than implicit and hidden under the guise of “optimal” or “efficient” use. To do so may lead to more than just improved social outcomes, but better overall socionatural outcomes that recognize the inextricable linkages between human well-being and our future ocean.

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