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Social equity is key to sustainable ocean governance

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Calls to address social equity in ocean governance are expanding. Yet 'equity' is seldom clearly defined. Here we present a framework to support contextually-informed assessment of equity in ocean governance. Guiding questions include: (1) *Where* and (2) *Why* is equity being examined? (3) Equity for or amongst *Whom*? (4) *What* is being distributed? (5) *When* is equity considered? And (6) *How* do governance structures impact equity? The framework supports consistent operationalization of equity, challenges oversimplification, and allows evaluation of progress. It is a step toward securing the equitable ocean governance already reflected in national and international commitments.

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INTRODUCTION

Oceans are shared spaces subject to competing claims and preferences over use¹; since the time of the Roman Empire's *Mare Clausum*, the oceans have alternately been contested by trade and colonial powers, or framed as global commons². Historical narratives positioning oceans as empty spaces of nature devoid of human life, and frontiers to be discovered, exploited, and conserved³, overlook less resourced, less powerful ocean-reliant peoples and their rights and claims^{4,5}.

Ocean governance that proceeds without a clear and thorough understanding of the complexities of equity is thus unlikely to achieve stated ambitions^{6,7} that include reducing global economic inequalities, improving human wellbeing, and sustaining the biosphere⁸. This is particularly so in the context of a rapidly accelerating ocean economy⁹ and emergent efforts to ensure that this 'blue growth' is environmentally sustainable¹⁰ and leads to improved human development outcomes¹¹.

The Oxford English Dictionary proposes this 'concrete' definition of equity: 'What is fair and right; something that is fair and right'. Such a broad definition, based on concepts that must themselves be defined or interpreted in diverse contexts, provides insufficient basis for application¹². Influential work from Rawls similarly equates equity and justice with fairness¹³, as does recent work on equity in marine conservation¹⁴. In the ocean governance literature, Jentoft addresses equity with the question, 'who are the winners and who are the losers?'¹⁵, which elides many of the

aspects of equity discussed in detail below. And salient international legal definitions of equity vary, from jurisdictional entitlements in the Law of the Sea to intergenerational equity in international environmental law¹⁶.

Furthermore, despite the inherently transboundary and entangled nature of ocean governance issues, ocean governance continues to suffer from a lack of effective coordinating mechanisms across scales and sectors^{10,17}. Many existing international ocean governance frameworks lack strong accountability, relying instead on voluntary commitments and self-reported achievements^{18,19}. Such agreements also often lack the specificity necessary for implementation²⁰. Uncoordinated, poorly specified, unaccountable governance allows the powerful to entrench and maintain their dominance. For example, as renewed attention to and acceleration of the blue economy creates new spaces and opportunities to exert control, or derive or direct benefits, the powerful seek to capture those processes and outcomes in order to maintain their position²¹. Less powerful constituencies may be further marginalized as a result²².

Although complex governance systems can act as a corrective for overly centralized power, diversification and expansion of the set of governance actors may counterintuitively increase power imbalances²³. The diverse institutions and organizations (including governments, NGOs, community cooperatives, etc.) governing oceans may exclude specific groups, worldviews, and development pathways²⁴, and may operate on pre-defined constructions of resource sustainability that omit consideration of short-term

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challenges faced by many²². As governance decisions seek to address recurring problems that are not tractable to simple technical fixes, necessitating deliberation among governance actors²⁵, solutions do not always reflect the perspectives or needs of all affected groups²⁴.

Although improving social equity is a stated goal of recent international agreements for sustainable ocean governance^{10,26}, instances abound of how current ocean governance creates, allows, and perpetuates inequity²⁴. For example, powerful vested interests may adopt exclusionary tactics or state-sanctioned violence to displace Black and Indigenous peoples from the resource access and coastal homelands to which they have legal and customary rights, with negative effects on food security, livelihood, and cultural heritage^{27,28}. Ocean and coastal conservation and management schemes based on scientific principles can erase or exploit the situated and relational knowledge systems of local and Indigenous peoples^{29,30}. Although small-scale fishers are prioritized in fisheries management rhetoric, they often remain locked out of governance processes³¹. Women are regularly excluded from fisheries management, from global fisheries commitments to participation in 'community-based' decision making, and subsequently suffer disproportionate management costs^{32,33}. Marine renewable energy development creates new ownership claims and rights to ocean spaces, conflicting with other uses³⁴. The seafood available to consumers may have been produced under conditions that violate international norms, policies, and conventions protecting the fundamental rights of workers and vulnerable populations, including children^{35–38}.

In general, arguments for engaging with social equity treat it as an inherently valuable governance end in itself, and/or as a means to other desired governance ends. These positions are not mutually exclusive. The former approach frames the pursuit of social equity as a moral duty and the primary motivator of social institutions^{13,39,40}. The latter asserts that social equity underpins or facilitates desired outcomes including political legitimacy and political, social, and environmental sustainability^{7,41–46}, usually as defined by hegemonic institutions⁴⁷. In the specific case of ocean governance, promoting social equity is typically framed as instrumental to achieving sustainability goals⁴⁵: oceanic and coastal peoples living in economic, social, or other kinds of precarity are unable to invest in longer-term resource stewardship while their short-term needs remain unmet⁴⁸, or while allocation of ocean space and resources foments conflict and threatens human security⁴⁹. Existing international agreements relevant to ocean governance link prioritization of social equity to economic expansion⁵⁰, accounting of ocean benefits⁵¹, emerging technologies^{52,53}, and much broader development aspirations⁴⁶.

Relatedly, oceans play a key role in regulating global climate, a core sustainability issue⁵⁴. Climate change impacts are projected to be uneven across states, and the novel challenges and opportunities associated with climate change will be unevenly distributed across different users of marine resources, altering power dynamics⁵⁵. Furthermore, climate impacts are entangled with pre-existing inequities⁵⁶. Coastal Indigenous peoples, for example, face disproportionate climate impacts⁵⁷.

With this Review, we intend to address a complex, contested, and ill-defined concept by (1) synthesizing equity considerations relevant to ocean governance; and (2) building a framework to structure conceptual and applied efforts to incorporate social equity into ocean governance. The interdisciplinary, critical review⁵⁸ is based on an iterative Google Scholar search initially focused on contemporary social theory, broader equity discussions, and previously developed frameworks, extended via a collaborative, deliberative expert-elicitation process^{45,59} with 27 ocean governance experts who focus on equity in their own work (see Supplementary Methods).

Instead of providing a single definition or prescription, we intend this work to enable critical consideration of equity, and to

make transparent the often obscure choices, assumptions, and value struggles that underlie equity claims. We hope to support contextually-informed, comprehensive consideration of a multi-faceted concept that is and will continue to be subject to competing constructions⁶⁰ and trade-offs across dimensions^{6,40,61}.

Our approach counters observed moves away from explicit consideration of equity in large-scale ocean development schemes¹¹, and responds to calls to systematically include equity in ocean governance^{11,50,62}. A more politically-grounded, holistic examination of equity, as presented here, may help to highlight issues that are typically elided in many existing, technocratic discussions, but which are nonetheless important on both ethical and instrumental grounds (e.g., the historical, path-dependent nature of inequity). While as a group we represent diverse backgrounds, traditions, disciplines, and positionalities, the dimensions of equity scoped here are drawn primarily from the liberal political tradition and critiques thereof^{13,39,42}.

A FRAMEWORK TO INCORPORATE EQUITY INTO OCEAN GOVERNANCE

Our proposed framework comprises a set of equity dimensions intended for use by ocean governance actors and researchers who aim to guide ocean policy, marine resource management, blue investment, advocacy, or research to achieve or assess sustainable ocean governance. Each dimension centers on an overarching question. The framework overview presented in Fig. 1 includes the basic dimensions of social equity examined here, as well as the connections between dimensions and the cumulative and iterative process of applying the framework as a whole. Box 1 presents a simplified case example designed to show an initial application of the framework.

The entry point and first dimension of the framework are encapsulated in the question 'Where—in what place(s) and context(s)—is equity being examined or addressed?' The manifestations, impacts, and correctives for existing ocean inequities can only be understood in situ: the lived experience of equity is mediated by the histories, cultures, and economic and governance systems and structures that attach to geopolitical context^{6,14,63}. Once this dimension of equity is established, the next question is 'Why is equity being examined or considered in this work?', referring to the intended ends of engaging with equity. Governance actors and researchers should clearly establish and/or understand the equity goals of their work and the systems they study, in order to guide examination of subsequent dimensions and lay the groundwork for evaluation.

Together, the initial two questions set the stage for consideration of the following three dimensions, encapsulated in these three questions: 'Equity for or amongst whom?' 'What is being distributed?' and 'When—at which stage(s)—in governance or research processes is equity being forwarded or considered?' These dimensions are iterative, as the answer(s) to one may depend on or be derived from the answer(s) to another, with the appropriate starting point dependent on governance or research focus.

The framework closes with a final question: 'How do (or might) governance structures mediate, create, or undermine equity?' This dimension is treated last as the answer to each preceding question improves our ability to identify proximate and distal causes as well as potential correctives. The question of 'how' may be particularly contentious in application; indeed, equity-based objections to potential governance changes should be examined in order to determine whether the responses to previous questions need rethinking.

While our framework does not offer simple answers, its details set the terms of debate and create grounds for comparison, and evaluation of progress towards equity goals. Deeper exploration of each framework dimension is presented below.

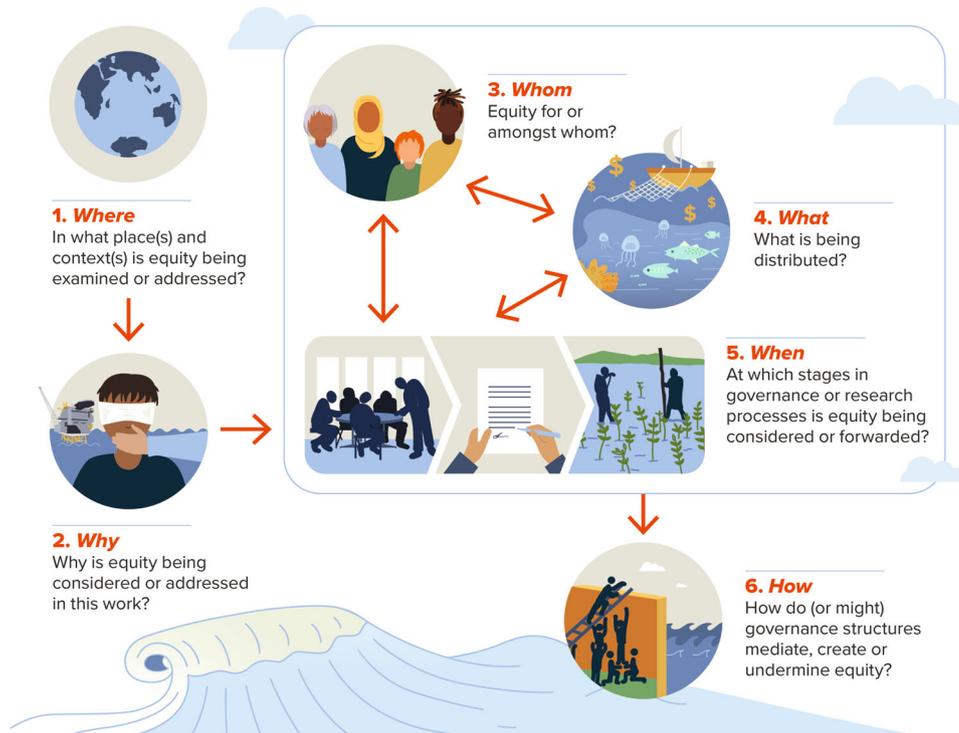


Fig. 1 The dimensions of social equity for ocean governance: a framework. Courtesy of Valerie Brodnikova.

Where—in what place(s) and context(s)—is equity being examined or addressed?

Social equity is both a characteristic of the society in which governance occurs and an outcome of governance^{60,61,64}. Understanding specific places and geopolitical, social, and cultural contexts/worldviews is foundational to understanding and centering social equity^{6,63}.

Inequity is path-dependent^{64,65}. Structural inequities rooted in historic and ongoing biases and related power dynamics (including those driving and driven by patriarchy, colonialism, genocide, slavery, war, social conflict, etc.) resonate around the world today, with impacts on environmental conditions⁶⁶ as well as the present-day freedoms of marginalized people to realize their full capabilities⁴⁰, their access to food and greater well-being⁶⁷, their inclusion in governance and/or rights to self-determination, and their vulnerability to environmental change⁶⁸. Centering social equity in ocean governance requires that researchers and governance actors begin from an understanding of the pre-existing inequities in the contexts in which they work^{14,24–26,61,69}. Consideration of research and governance context enables more informed, specific, and actionable understandings of equity, and may in turn be used to scope, select, and accomplish equity-related governance goals through application of the rest of the framework.

Understanding place and context means seeing, acknowledging, and respecting applicable histories and contemporary hierarchies of power and marginalization. At the international scale, for example, where institutions exist to coordinate ocean governance, different levels of political and economic power between nation-states can shape access to marine resources in more or less equitable ways, such as through trade or the activities of distant water fisheries^{70,71}. Within nations, status derived from ascriptive characteristics (such as gender, race, ethnicity, etc.) heavily influence place-based activities and the nature and outcomes of and ocean governance interventions, as is the case in the coastal Philippines for groups defined by ethnicity and time of migration^{72,73}. Similarly, governance processes such as

implementing marine protected areas are subject to power hierarchies embedded in inequitable relations between local communities, NGOs, and government actors in terms of who decides, who represents whom, and who is accountable to whom^{74,75}.

Why is equity being examined or addressed?

The second dimension of equity encourages researchers and governance actors to define their intended ends, or what they hope to accomplish vis-à-vis equity in the specific context(s) and place(s) in which they work. Establishing concrete equity goals will assist practitioners in their efforts to scope, design, and evaluate governance interventions with an equity lens⁷⁶. Prior work that examines equity in payment for ecosystem services schemes suggests three potential categories of ends: 'no equity goals' (i.e., equity is not a consideration), 'do no harm,' and 'advance equity' (that is, attempt to forward social equity, given the context or 'Where', as described above)⁶¹. We add the potential goal of restorative justice, understood to be a collective undertaking to reveal, heal and redress the legacies of past injustice/inequity⁷⁷.

Equity goals are not always made explicit and the above categories may not always be clear-cut in application. Furthermore, goals may evolve during governance processes²⁵. However, implicit selection of 'no equity goals' may reinforce existing inequities that are problematic on both fundamental and instrumental grounds. For example, individual transferable quotas were widely adopted in fisheries management with the intention of realizing economically efficient allocation, with little upfront attention to potential equity effects⁷⁸. The resulting consolidation of quotas in the hands of powerful actors reinforces power hierarchies that lock small-scale fishers and others out of decision-making and into exploitative leasing arrangements⁷⁹.

Equity for or amongst whom?

The third, fourth, and fifth questions in our framework should be considered iteratively, but will be addressed in turn here for the

Box 1 Case application of the framework: fisheries access in Fiji

Where is equity being examined or addressed? *Fijian coastal fisheries.* In Fiji, practical access to coastal fisheries is mediated by ethnicity and descent. Fiji was historically inhabited primarily by Indigenous Pacific Islanders with roots in Melanesia and Polynesia. During British colonial rule (1874–1970), indentured laborers were brought from India to work the islands' sugar cane fields. The contemporary legacy of British colonial policies includes distinct sets of rights reserved for *iTaukei* (Indigenous) Fijians versus Indo-Fijians and others. While all Fijians have the *de jure* right to fish for subsistence, *iTaukei* Fijians have special customary rights to traditional coastal fishing grounds¹²⁹. These grounds dominate Fijian coastal waters and are often adjacent to traditional *iTaukei* villages. For non-rights holders, commercial fishing access in traditional grounds is often contingent on goodwill payments to local chiefs, despite official prohibition of that practice¹²⁹.

Why—to what ends—is equity being considered or addressed? *To advance equity.* Our goal is to advance equity of access to fisheries, given current inequities elucidated above.

Equity for or amongst whom? *iTaukei and Indo-Fijians.* Our level of comparison is social group, and we limit our comparison to the two largest social groups in Fiji: Fijians of *iTaukei* descent, and Fijians of Indian descent.

What is being distributed? *Access to fisheries as an input into access to healthy food.* We focus on access to fisheries as an input into access to healthy foods. Indo-Fijians fish significantly less, and purchase more of the fish they do eat, than their *iTaukei* counterparts¹³⁰. Goodwill payments create additional financial stress and can result in food insecurity for Indo-Fijians who rely on sales of their catch to purchase other goods¹²⁹.

When—at which stage(s)—in governance or research processes is equity being forwarded or considered? *Governance outcomes.* Our focus on access to fish as food implies focus on governance outcomes.

Iterate. The foregoing shows that the current system results in inequitable access to fisheries, and thus healthy food, to the disadvantage of Indo-Fijians. This is true, as far as it goes, and under the specific terms elucidated above. However, the example also illustrates how the framework can draw attention to what is omitted from consideration. Omissions from the above include (but are not limited to): (1) deep engagement with historical colonization and current political context, and the power, social roles, demographics, and experiences of the two primary populations of interest; (2) non-commensurability of the compared groups, based on Indigenous sovereignty and concomitant preferential rights to historical lands and waters and the resources therein; (3) broader inquiry into healthy food access (subsistence foods beyond fish, etc.); and (4) how other stages of governance influence fishing access—for example, monitoring and enforcement of existing rules. If we use the framework as intended, these omissions prompt us to revisit our answers to each question above.

How do (or might) governance structures mediate, create, or undermine equity? In this case, iterative application of the framework moves us away from simplistic recommendations that might be objected to on equity grounds (such as direct allocation of a proportional share of catch to Indo-Fijians), and towards recommendations that take a more holistic approach. Indigenous rights and Indo-Fijian fishing access might both be served, for instance, by allocational strategies that give priority to the claims of traditional rights-holders or by a collaborative fisheries governance reform process that gives power and voice to all affected groups.

Space limitations preclude full discussion of potential iterations and pathways through the framework. However, we hope this very simplified example demonstrates how framework use can improve transparency and clarify the assumptions and tacit decisions underpinning a specific application of the term 'equity.' This in turn helps to identify areas of contention, grounds for comparison, and evaluation of progress, and potential solutions.

sake of clarity. Each of them builds on the foundation of the first two dimensions. Having explored the influence of place and context, and established clear goals, we turn our attention to whom equity is for or amongst.

The first component of this dimension is the hierarchical level(s) of social organization at which equity comparisons are made^{61,80,81}: for example, on geographic/geopolitical grounds, including between groups of nations⁸², nations⁸³, regions^{43,84}, and communities⁴³. Beyond national jurisdiction, the seabed and its mineral resources may be considered the 'common heritage of [hu]mankind', yet capacity imbalances and conflicting commercial and ecological imperatives result in inequities of access between states⁸⁵. And national-level equity comparisons are a key component in fisheries negotiations between developed states and developing states, and distant water fishing flag states and coastal states⁸⁶. Indeed, such negotiations are structured by equity considerations around conservation burden and sovereignty over coastal resources⁸⁷. Despite their prevalence, however, higher-

level (e.g., national) equity comparisons made on geopolitical grounds ignore both powerful transnational actors and globalized inequities that transcend the boundaries of nation-states⁶⁰, such as those based on gender, race, and class. Relatedly, national-level equity comparisons are of particular concern for those Indigenous polities (such as Canadian First Nations, Métis, Inuit, and Native American tribes) whose 'nested sovereignty'⁸⁸ is often rendered invisible by comparisons at this scale.

Social groups may also be used as the grounds for equity comparisons^{64,69}, as is the case when governance actors or scholars examine disparate ocean governance impacts on groups delineated by ascriptive characteristics such as gender, race, ethnicity, etc. Levels may be combined in equity comparisons: for example, racial or ethnic groups within communities⁸⁹ or across national boundaries. However, groups defined on a single dimension (e.g., gender) risk obscuring the different experiences of non-homogeneous group members: intersectional analysis may fruitfully address this oversight⁶³. Additional levels of comparison are also possible; in discussions of fisheries management, for example, equity comparisons are commonly made between groups delineated by fisheries sectors (e.g., industrial vs. small-scale, subsistence vs. commercial)⁹⁰ or gear types⁹¹.

The second component of the 'whom' dimension is the 'bounds of the community of equals'⁸⁰ which delimit which nations, groups, individuals, etc. are included in or excluded from the entities being compared. Simply put: at a given level of comparison, who is in, and who is out? While aspirational documents like the Universal Declaration of Human Rights explicitly reject any bounds on the community of equal individuals⁹², theory and application often set community bounds based on criteria like membership (e.g., citizenship status or legal rights) or ascriptive characteristics^{64,65}. Equity comparisons may also include future, or only current, generations of humans, as well as differential treatment of present and future costs and benefits. Strong arguments for consideration of future generations in ocean governance derive from sustainability discourse, which requires consideration of intergenerational equity by definition^{41,83}.

Failing to engage with the practical bounds of the community of equals can lead to false conclusions and implementation failures. Some Indonesian MPAs have failed because outreach and participation programs have treated local villages as communities of equals living in one place, leaving out the asymmetric power relations of debt and loyalty between fishers, traders, and their patrons^{74,93}. And level and bounds can interact in damaging ways for groups that fall outside entrenched social divisions. Sea-based and sea nomadic societies, such as the Bajau and Orang Laut of Southeast Asia, are systematically excluded from ocean governance processes. As mobile, trans-local, or even stateless peoples, they fall outside national-level comparisons as well as established categories of 'citizens', 'local communities', and 'Indigenous peoples', further marginalizing them from ocean governance^{93,94}.

And although equity comparisons framed around stakeholders are common^{95,96}, they are often problematic across both components discussed above. First, the term 'stakeholders' obscures differences in the basis and nature of claims between different groups. Specifically, the term diminishes customary, traditional, or treaty rights-holders' claims to a 'stake' rather than a sovereign right; for this reason, many Indigenous rights-holders object to the term. Second, naïve formulations of stakeholders gloss over differences in preference and experience that divide individuals within stakeholder groups. Women, for instance, may face double exclusion when their role in ocean practices is overlooked or undervalued⁹⁷. Third, the experience and impacts of ocean governance on different stakeholder groups may be incommensurable: for example, oil and gas industry actors and coastal communities may have similar, overlapping, or entirely separate understandings and experiences of the costs and benefits of coastal development. Efforts to render impacts

commensurable through economic valuation may mask and/or perpetuate inequity by ignoring other values⁹⁸, creating false equivalencies, and tacitly privileging existing powerholders. Fourth, efforts to engage stakeholders through participation in ocean governance routinely omit less politically or economically powerful and organized voices from consideration⁹⁹, as these groups are seen as difficult to engage with, or unnecessary to governance success due to their perceived inability to effectively object. This is especially the case where privileged organizations (e.g., corporations, nonprofits) are tasked with leading stakeholder engagement, despite being stakeholders themselves.

Finally, here we primarily consider social equity as applied to human populations. However, Indigenous and multispecies scholarship challenge the notion that the social realm is limited to humans, seeing humans as socially engaged with other beings^{30,100} like corals²⁹ and whales¹⁰¹. Indeed, non-human beings, ecosystems, and natural features such as rivers are increasingly acknowledged as not only objects of care but also subjects of rights, sometimes with accompanying governance frameworks that endow them with legal personhood, or empower local custodians to give voice to nature in decision making^{102,103}. The answer to 'Equity for or amongst whom' may thus include species or ecosystems.

What is being distributed?

The fourth framework dimension further specifies equity in application by directing focus to that which is being distributed. Distributional objects may be broadly categorized, such as rights, conditions, or capabilities, as is common in theoretical/aspirational, liberal formulations of equity^{39,40,42,46,92}. More specific distributional objects commonly discussed in ocean governance fora include access to space (e.g., fishing grounds¹⁰⁴) and resources (e.g., seabed mineral resources⁸⁵), and the costs and benefits of management (e.g., conservation burden²⁰), development (e.g., of marine genetic resources⁵²), and environmental change (e.g., sea-level rise¹⁰⁵).

Recognition, focusing on the distribution of attention and discursive power, is also subject to distribution. Examining the distribution of recognition requires explicit attention to the frames that ocean governance actors, researchers, and the governed impose or contend with²². Governance actors and the governed may come from different cultures with different culturally-informed worldviews and belief systems^{6,7,14,44,60}. Furthermore, multiple worldviews can be held simultaneously within a single management coalition or, indeed, within the mind of a single individual¹⁰⁶. Addressing recognition in distribution necessitates, however, moving beyond acknowledging difference to interrogating the extent to which different worldviews, assumptions, etc., are given power, and the extent to which such differences are actively incorporated into governance processes⁶⁰. For instance, the use of behavioral science strategies in marine conservation rests on largely unspoken assumptions about the universality of human cognition and behavior, failing to recognize evidence that the behavioral responses found in primarily "WEIRD" (Western, educated, industrialized, rich, democratic) study populations have limited generalizability to other demographics^{107,108}. As an example, despite evidence from WEIRD contexts that descriptive norms (i.e., individual perceptions of others' likely behavior) are positively related to individual behavioral choice, Indonesian coastal dwellers' descriptive norms showed no such relationship with their intentions to fish sustainably or responsibly dispose of waste¹⁰⁹.

Representation, focusing on the distribution of political power, is also subject to distribution. Representation includes access to and involvement in governance processes^{43,60}; voice, and the influence and impact of voice across governance stages²⁶; and the distribution of decision-making power⁴⁴. High-level efforts to improve representation do not always lead to lower-level change. For instance, although the 2014 UN Food and Agriculture

Organization's Small-Scale Fisheries Guidelines recognize the importance of small-scale fishers to coastal livelihoods and food security, small-scale fishers remain unorganized and socially and politically marginalized in many contexts³¹. Resulting representation failures have manifested in Marine Spatial Planning undertakings^{110,111} as well as in Regional Advisory Council processes in the European Union¹¹².

When—at which stage(s) of governance or research processes—is equity considered or addressed?

The fourth framework dimension identifies when, in an ocean governance and research process, equity is considered or centered^{26,69}. The conservation literature focuses primarily on equity as an outcome (for example, in the distribution of benefits from conservation), or in the implementation phase of policy⁶; however, incorporating equity thinking early and throughout ocean governance processes may improve equity²⁶. Indigenous and Aboriginal groups' early engagement in marine governance initiatives in Canada, New Zealand, and Australia, for instance, suggest that involvement in organizing and negotiating *before* precedents are set led to more equitable stakes in marine economic development¹¹³. Conversely, issues of equity addressed toward the end of regional ocean governance processes, such as when Marine Spatial Planning stakeholder participation occurs largely after decisions have been made, suggests to participants that ocean governance processes exclude less powerful stakeholders by design⁹⁹.

How do (or might) governance structures mediate, improve, or undermine equity?

The framework closes by directing attention to how existing governance structures, or proposed governance changes, mediate, improve, or undermine equity. This dimension addresses the equity effects of the specific institutional structures and governance processes at play in the context under consideration.

The first component of this dimension refers to what is variously termed procedural justice or procedural equity^{6,42,61}. It is closely related to the questions of recognition and representation raised above, but focuses on the governance processes and procedures by which recognition and representation are accomplished: that is, decisions and rules structuring how decisions and rules are made (i.e., collective choice and constitutional-level rules¹¹⁴).

Participation and representation are commonly forwarded strategies to improve social equity through procedure^{6,7,31,43,44,61,69,83,104,115}. In Arctic Alaska, for example, cooperative Bowhead whale management decision-making between federal agencies and Indigenous Iñupiat community representatives balances conservation and Indigenous whaling, yielding more equitable recognition of cultural values¹⁰¹. However, the details of participation and representation are often poorly or problematically specified in application¹¹⁶. Participation that assigns decision-making power to participants is different to participation without such decision-making power¹¹⁷, and participation in defining an ocean governance problem is different to participation in implementing solutions. And as new actors enter ocean governance fora, perhaps under the rationale of participation as a means to increase equity and effectiveness^{15,31}, new power dynamics are introduced and representation takes new forms²³. In Fiji, for example, villagers who perceive NGO-mediated community participation in governance of traditional fishing grounds to have been limited solely to accepting area closures do not fully implement and comply with those closures¹¹⁸.

Similarly, the equity effects of representation will vary with how representatives are elected or appointed, the extent and type(s) of power they hold, and by whom and how they are held accountable. Accountability, and thus representation, may be diluted where the less powerful are beholden to the more powerful, who themselves face mixed incentives²³—for example,

where corporate actors are tasked with designing or implementing equity improvements. Similarly, in the non-profit sector, smaller NGOs must respond to the demands of larger organizations that act as funding conduits, and both smaller and larger organizations must meet the preferences of funders¹¹⁹. In Papua New Guinea, for example, funders' emphasis on coral reef conservation led a large non-profit to deprioritize the demands of the local populations the NGO claimed to serve¹²⁰. And when non-local conservationists advocate for local change, or when well-funded, high-profile researchers from the Global North overshadow colleagues from the Global South¹²¹, questions of representativeness also arise. Across such cases, legitimacy of representatives can only be granted by those being represented.

Transparency, another component of procedural justice, hinges on the importance of information as a distributional object, how distribution of information is accomplished, and to what equity effects. Transparency may enable both informed participation¹⁴ and accountability¹²², thereby exerting a compound effect on procedural justice. However, transparency as an equity strategy falters at the 'digital divide': inequitable access to technology and data¹²² and inequitable capabilities to process available information. In international fisheries negotiations and management, for example, transparency can support equitable participation and decision making by providing a more level playing field, enabling broader access to necessary data, and ensuring accountability in decision making and implementation¹²³. But calls for transparency may conflict with states' strategic interest in the control of information¹²² and undermine collective strategies if developing states are unable to confidentially develop mutual positions to mitigate power imbalances¹²³.

The second component of the 'how' dimension focuses on allocative strategies: the specific mechanisms by which distribution is accomplished. Nowhere is the positional and contested nature of equity more obvious than in the question of allocation. In some cases equitable allocation may be defined as pure equality, whereby everyone gets an equal share of a given distributional object^{6,7,80,124}, or, alternatively, equal chance of receiving it (e.g., a lottery) or equal voice in distribution (distribution according to the results of a full-franchise equal vote)^{76,124}. Yet equality, however, construed, ignores rights-based and need-based claims^{76,80,124} grounded in place and context, meaning that equal allocation is often inequitable in effect. Allocation by need comes under challenge by those who prefer allocation by effort^{7,80}, performance⁸⁰, merit^{76,124}, competition¹²⁴, economic demand¹²⁴, value⁴¹, ascriptive characteristics^{64,124}, historical precedent¹²⁵, or on some other basis. Some foregoing criteria are subjective and difficult to operationalize, like merit, and others, like economic demand or willingness to pay, reflect inherently inequitable assumptions⁴¹. Unsurprisingly, allocation is passionately debated in ocean governance: for transboundary tuna, reaching consensus on equitable allocation frameworks has been problematic across regional fisheries management organizations¹²⁵, with discussions in the Indian Ocean Tuna Commission making little progress after a decade of negotiations¹²⁶.

RECONSTRUCTING SOCIAL EQUITY

Applied in its entirety (Box 2) the framework allows researchers and governance actors to make progress toward operationalizing social equity. However, as noted at the outset, a majority of scholarly work cited here is grounded in liberal political theory and governance systems, although equity and related concepts are a feature of diverse traditions relevant to ocean governance¹²⁷. It should be clear from the preceding discussion that operationalizing equity requires input from a variety of traditions and voices¹²⁸: for example, Indigenous frames that embrace a relational perspective whereby equity considerations encompass the well-being of both human and non-human ecologies³⁰.

Box 2 Centering equity in ocean governance: Getting started

□ 1. *Where—in what place(s) and context(s)—is equity being examined or addressed?*

Action: Locate specific, existing inequities and their distal and proximate drivers in the place(s) and context(s) under consideration.

Recommendations:

- Identify baseline societal power dynamic and their interactions, histories and expressions
- Consider how these shape or impact or research and governance in this context

□ 2. *Why—to what end—is equity being examined or addressed?*

Action: Establish clear equity goals for the governance intervention or research undertaking.

Recommendations:

- Seek to improve the conditions identified under 'Where'
- Identify contextually appropriate measurement to track progress toward equity goals

□ 3. *Equity for or amongst whom? (iterative with 4 and 5)*

Action: Specify the groups for or amongst whom equity is being assessed, and identify who is empowered/ disempowered/excluded by group definitions

Recommendations:

- Make equity comparisons explicit on both level of comparison and community bounds
- Consider intergenerational impacts
- Ensure that the groups underpinning comparisons are commensurate
- Design data collection and evaluation at finer scales to capture inequities mediated by group membership and intersectionalities

□ 4. *What is being distributed? (iterative with 3 and 5)*

Action: Specify what objects are being distributed by or in the research or governance intervention

Recommendations:

- Identify the objects (goods, services, costs, benefits, rights, access, etc.) being distributed, including non-financial costs and benefits
- Identify and acknowledge the distribution of discursive power (attention to different frames, worldviews, and underlying assumptions)—recognition—and its equity effects
- Identify and acknowledge the distribution of political power (voice, decision-making, veto, etc.)—representation—and its equity effects

□ 5. *When—at which stage(s) of governance or research processes—is equity considered or addressed? (iterative with 3 and 4)*

Action: Identify or specify the stages at which equity is or will be considered in the research or governance initiative

Recommendations:

- Prioritize equity early on and throughout research and governance processes

□ 6. *How do (or can) governance structures mediate, improve, or undermine equity?*

Action: Identify how existing governance institutions and processes structure access to power and resources, potential governance alternatives, and associated equity effects

Recommendations:

- Grapple with how existing governance structures create and address inequities of voice, decision-making power, and discursive power
- Make explicit the allocative criteria in use and their equity ramifications across dimensions
- Identify potential correctives grounded in the answers to each framework question above

Thus, we add an additional, aspirational question: How can the process of delineating social equity for ocean governance itself be made more equitable⁶¹? How can governance actors and researchers incorporate underrepresented perspectives not only into ocean governance, but also into the framing and conceptual scoping process undertaken here? Answering this question will require self-reflection: What might be missing from the framework presented here? How are we making decisions about each of the above dimensions? What deep assumptions and biases are influencing our choices and interpretations, and how can we transcend them?

APPLYING EQUITY

Our primary intention here is to support and structure efforts to critically and holistically engage with equity issues, as a first step to forwarding social equity in ocean governance. It is our hope that this framework will be applied, studied, and evaluated in follow-up research in different sectors and geographies.

The above dimensions of social equity may be iteratively applied to an ocean governance or research context through the checklist presented in Box 2. The framework dimensions are recognizably distinct but deeply intertwined: each dimension speaks to and influences the others. For this reason, although applicability of each dimension may vary by context, we recommend that researchers and governance actors apply this framework in its entirety in their work. The question(s) underlying each framework dimension should be carefully considered, even if the dimension does not initially seem relevant.

Thus applied, the framework allows us to set clearer, more comprehensive objectives, improve evaluation of ocean governance, identify how and where equity is currently insufficiently or ineffectively addressed, and identify trade-offs between different dimensions of equity, all in service of desired governance outcomes and impacts. Only by explicitly and systematically addressing equity in ocean governance processes and outcomes will it be possible to assert a better future for ocean spaces, resources, and the people who rely on them.

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AUTHOR CONTRIBUTIONS

K.M.C. conducted the initial literature review, drafted the framework, and wrote the first draft of the paper. Y.O. and E.H.A. supervised the initial development of the work. All authors workshopped the framework, contributed revisions to subsequent drafts, and read and approved the final version.

COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

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