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Shouting into the void: Democratising ocean literacy through integrating process literacy

Emma McKinley^{a,*}^o, Kathryn Fradera^b

^a School of Earth and Environmental Sciences, Cardiff University, Cardiff CF1-0 3AT, UK
^b School of Law, University of Glasgow, Glasgow G12 8QQ, UK

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ABSTRACT

Since its inception, ocean literacy has evolved from a concept grounded solely in formal education processes to one that is increasingly focused on delivering ocean literacy as a societal outcome more broadly. Key to achieving its desired outcome of increasing understanding of the complexity of human-ocean relationships is understanding how these relationships are managed through marine planning and regulatory processes. As a complementary concept, process literacy involves increasing understanding of the operation and complexity of regulatory and planning policy processes. In this paper we consider the alignment of the concept of process literacy to ocean literacy to operationalise the latter and ensure that developing more nuanced understandings of how marine spaces are managed is central to ongoing ocean literacy efforts. Using the UK as a case example, we define the dimensions of process literacy and discuss the importance of increasing knowledge and awareness of marine decision-making processes to democratise marine spaces. Where ocean literacy is increasingly inclusive of the complexities of socio-ecological ocean systems, the addition of process literacy speaks to the need to understand political and wider governance processes to gain understanding of the practicalities of human-ocean relationships. In this paper we discuss the relationship between ocean literacy and process literacy before outlining definitions for process literacy dimensions. We define process literacy as a crucial component of ocean literacy and explore its links with spatial justice. As an emerging area of research and practice, we provide recommendations for future directions to support ongoing efforts to realise the potential of ocean literacy.

1. Introduction

Since its inception in the early 2000s, ocean literacy has evolved from a concept grounded in formal education processes, to one that is more all-encompassing of the complexity of human-ocean relationships and seeks to deliver a societal outcome, rather than a sole focus on individual awareness-raising [13]. Defined at its simplest as 'having an understanding of your influence of the ocean and the ocean's influence on you' [5], with its positioning as a mechanism for restoration and transformation within Challenge 10 of the UN Decade of Ocean Science for Sustainable Development (2021-2030), ocean literacy has gained significant traction in recent years [18,28], increasingly reframed as a societal outcome rather than an individual process [13]. This newfound central position within ocean discourse is rather at odds with its previous placement on the periphery or as a 'nice to have' over the last two decades. However, where ocean literacy as a concept is becoming more established and normalised within marine planning and

decision-making discussions, it remains as a "nice to have", or considered too challenging to apply, within much of marine governance, planning and regulatory practice.

Fundamental to the evolution of ocean literacy in recent years has been a broadening out of the concept – where once the emphasis was on the inclusion of ocean science within marine education, recent scholarship proposes multiple dimensions of ocean literacy, including awareness, communication, attitudes, Emoceans (i.e emotional connections as described by McKinley et al. [18], adaptive capacity, access and experience among others [3,10,18]. As the concept has continued to evolve, the dimension of knowledge has remained a central tenet – albeit, with a welcome emphasis on the importance of embracing different knowledge types within ocean literacy theory, evaluation and assessment [18]. In addition to meaningful integration of Indigenous, traditional and local knowledges [32], it is increasingly acknowledged that the ocean knowledge must include fostering and development of process and procedural knowledge is fundamental to empowering an

* Corresponding author. E-mail address: mckinleye1@cardiff.ac.uk (E. McKinley).

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ocean literate society for the benefit of both people and the ocean [18, 20].

Here, we focus specifically on this historical lack of process and procedural knowledge within the concept of ocean literacy. Adding the specific term and concept of "process literacy" to ocean literacy discourse acknowledges the fundamental role of human decision-making processes in shaping ocean spaces and our interactions with them. Without meaningful access to decision-making processes, citizens are often excluded (intentionally or not) from marine public realms [6,11] and therefore excluded from the ability to gain literacy in how the ocean/human relationship both forms ocean spaces, and how ocean/human interactions are managed. This exclusion is a particular issue when considering the lack of meaningful inclusion of diverse communities within ocean decision-making - there is a significant volume of work evidencing the lack of inclusion of Indigenous communities, traditional rights holders and local communities and the inequity this causes in ocean governance and resource distribution (see for example, [1,7,23]). In any case of exclusion from the process, a key challenge is that without the understanding of how regulatory and planning decisions are made for ocean spaces, the ability to easily access these decision-making processes, or an understanding of how and where diverse knowledge systems can be meaningfully integrated into decisions, citizens are limited in their ability to gain a holistic understanding of oceanic ecosystems or the potential for them to have a role in their management.

Through this paper, we propose that realising impact of the current momentum around ocean literacy as an aspirational societal outcome requires process literacy i.e. the awareness, knowledge and access to ocean decision-making processes, to be centred within ocean literacy initiatives. As we reach the midway point of the UN Ocean Decade and look towards the 3rd United Nations Ocean Conference in Nice in 2025, it is both timely and necessary to consider how to continue to push ocean literacy discourse forward to realise maximum potential and impact in ways that are just and equitable. Efforts to raise ocean knowledge within all facets of society must be inclusive of knowledge about the process of decision-making, and how participation can be realised and facilitated in a meaningful way. Without this, there is a risk that awareness raising initiatives will and lead to a feeling of well-informed citizens shouting into the void, which could then in turn lead to disenfranchisement and exacerbate feelings of disengagement and frustration.

1.1. Defining process literacy and its application to the UK's marine governance landscape

We define "process literacy" as having an understanding of how a regulatory or planning policy process operates, how decisions are made, and how stakeholders (including the public) can engage within these processes. In an ocean context, a process literate individual would, therefore, be defined as someone has a good understanding of how their ocean area is defined and managed and how to engage with relevant decision-making processes to be able to share their knowledge or concerns about management decisions. The knowledge and processes inherent within process literacy will vary according to social and cultural contexts i.e. the marine process in the UK will be different to the marine processes undertaken by traditional rights holders, Indigenous communities and other groups with customary management structures [24]. In any context, we can consider process literacy from two perspectives: (1) for citizens and other stakeholders impacted by, or otherwise interested in, ocean governance, however abstractly, and (2) for marine planning decision-makers, regulators and others working within broader ocean governance. While increasing process literacy is similar for these two groups, there are subtle and important differences, as outlined below.

To unpack process literacy, the UK, and specifically England serves as a case study for application. For marine citizens [4,19] and stakeholders in the UK, process literacy involves gaining knowledge of how marine spaces are managed, how decision-making processes operate, and how they are nested within wider spatial and social governance frameworks. Further, if involves understanding how and when people can engage with governance processes, and importantly, the limitations of particular types of engagement and how this might impact the role of communities.

In English waters, the Marine and Coastal Access Act 2009 states that decision-makers must have regard to "(a)the need to protect the environment, (b) the need to protect human health, (c) the need to prevent interference with legitimate uses of the sea, and such other matters as the authority thinks relevant" ([14], s69(1)). This means that any representations made to the planning or licensing authority, the Marine Management Organisation, will only be considered relevant to the decision if they fall within these, notably vague, categories. Understanding what is included within the terms "environment" and "human health" require a thorough review of the Acts explanatory notes, and further, detailed knowledge of the historic development spatial planning terminology within, for example, The Town and County Planning Act 1991, the National Planning Policy Framework [22], and spatial planning case law. A detailed definition of what can and cannot be considered as belonging to these terms is outside of the scope of this paper; however, the point being made here is that for citizens to be able to engage with marine regulatory processes in a meaningful way, knowledge of the "rules of the game" is required. Without this, representations made against draft marine plans or marine licence applications that do not draw on/align with knowledge of the process and what 'fits' the statutory requirements of decision-makers, can be rightfully dismissed as irrelevant by the licensing authority, due to not fitting the scope, but this decision may seem erroneous or immoral for the objector [6]. This argument is developed further in the next section.

For marine planning decision-makers across a range of geographical scales, then, process literacy involves understanding - really understanding - the processes they are operating and the contexts within which they are operating. This involves more than merely "following a process". It involves understanding the limits of their remits, where each process fits within nested spatial and social governance frameworks, how the process has been developed, how it could further develop, and, perhaps most critically of all, how to explain all of this to stakeholders and citizens. In other words, it requires marine regulators and planning decision-makers to have expert knowledge of, for example, spatial planning, marine spatial planning, and governance and democratic processes more holistically. This is no small feat, but it is an important one which is by no means new. Indeed, the important linkage between (marine) environment ethics and (marine) environmental management are incapsulated in thinking about values conflicts in marine space where "the complex interactions of the highly diverse systems housed with even more complex ecosystems are [...] a cue to up the ante against the simplified answers that are routinely trotted out by well-meaning organizations" ([26], p25). It is here where we see clearly the crucial need for process literacy to form part of ocean literacy.

2. Process literacy as critical for ocean literacy

A complex theoretical paradigm, process literacy becomes more accessible when aligned to the evolving ocean literacy framework and its multiple dimensions [10,18]. Its value is found in its application. One cannot be abstractly process literate, as this literacy necessarily must relate to a given process. The alignment between process literacy and ocean literacy is illustrated in Fig. 1 and expanded below through consideration of how process literacy could be integrated into the multiple dimensions of ocean literacy.

2.1. Knowledge

Increasing process literacy here involves marine planners, regulators and other stakeholders gaining knowledge of decision-making processes and how they are nested in wider governance and decision-making



Fig. 1. Aligning process literacy with the ocean literacy dimensions as described by [18].

frameworks. This includes knowledge of how marine planners and regulators can meaningfully engage stakeholders and knowledge of legislative framework and case law in relation to planning decisionmaking processes. From a community perspective, this involves having a knowledge of how to get involved in marine decision-making, where the entry points exist and what is considered in the remit of each decision-making process.

2.2. Awareness

Process literacy in this area involves increased awareness of the challenges for stakeholders in either accessing or understanding decision-making processes (or both). In addition, stakeholders gain awareness of challenges faced by marine planners and regulators and make efforts to address these to enhance equitable access to process and maintain democratic accountability

2.3. Attitude

A process literate attitude is one that is considerate of stakeholder and marine planner/regulator perceptions, values and views towards plans and decisions. Attitude also includes consideration that different marine planners and decision-makers bring their own views, values and perceptions to the processes they are working within, and these will in turn influence the efficacy of the process.

2.4. Behaviour

This involves adopting a mindset of curiosity towards different values within a process and striving to improve planning and decisionmaking processes. This includes adopting a collaborative rather than combative mindset when engaging in marine planning and decisionmaking processes (as decision-maker or stakeholder). From a community perspective, the dimension of behaviour relates to people being willing to become active participants in marine decision-making processes and accept that the need for compromise is inherent in the process.

2.5. Activism

Increased process literacy here involves stakeholders seeking out opportunities to feed into planning process improvements/reform. This includes sharing knowledge and ideas about how to improve planning and decision-making processes and ensuring communities can contribute the overall process. For communities, process literacy in the context of the dimension of activism relates to having the capacity to get involved meaningfully in activism activities at different stages of marine decision-making processes.

2.6. Communication

A high level of process literacy is required for marine planners and regulators to be able to communicate their planning and decisionmaking processes work. This includes communicating how stakeholders and communities can engage with these process and signposting to other decision-making processes if more relevant. The boundaries of a process should also be communicated clearly with stakeholders and nontechnical language used in public facing documents allowing stakeholders access to planning and decision-making.

2.7. Emotional connection

Emotional connections (or emoceans) is closely linked to attitude and involves understanding that a person may hold strong feelings about how decisions within marine planning and regulation are made, likely based on past experiences. Poor decision-making or a lack of opportunity for meaningful engagement resulting in exclusion of actors from decision-making processes can result in negative perceptions and emotions being held about a process, which may in turn act as a barrier to future engagement and impact perceptions of trust about these processes. There is the potential for this to lead to ineffective implementation of management interventions, impact overall social acceptability of decisions or result in a breakdown in relationships between stakeholders.

2.8. Access and experience

Closely linked to communication, this dimension involves making processes 'accessible'. This means that marine planners and regulators are able to use clear, non-technical language during consultation and stakeholders are provided adequate, and crucially accessible, opportunities to engage with decision-makers. High process literacy in this area requires that marine planners and regulators have extensive experience of how the process works, including lessons learnt from previous experiences and that they consider how best to engage with diverse audiences. Passive consultation processes are not sufficient, and more efforts need to be taken to ensure ocean literacy initiatives enhance awareness of how to feed into these processes more proactively.

2.9. Adaptive capacity

Closely linked to attitudes and behaviour, marine planners and regulators with high process literacy in this dimension are able to adapt and respond to changing planning or consenting needs through their knowledge of the processes they operate. Furthermore, enhancing process literacy as part of ocean literacy initiatives would contribute to the overall adaptive capacity of communities in the face of changing coastlines.

2.10. Trust and transparency

Increasing process literacy here involves increasing stakeholder trust in planning and decision-making processes. This includes operating fair and transparent processes and ensuring that the choices made within processes are clearly explained and justified, while facilitating open and accessible opportunities for participation.

The need for concerted efforts to increase process literacy, both for citizens and stakeholders and for regulators, planners and other marine governance practitioners has both practical and theoretical importance. In practical terms, increasing process literacy as part of overall ocean literacy allows for greater adherence to regulatory and legal requirements. In the UK this includes the Aarhus Convention and The Marine Works (Environmental Impact Assessment) Regulations 2007 in relation to public participation and access to decision-making forums). While threat of legal challenges should not be the motivating factor to increase process literacy, it does provide a strong incentive as limiting such challenges has financial and reputational benefits for regulatory authorities.

At a more human scale, increasing process literacy within stakeholder groups makes the practice of decision-making easier, more equitable and less resource intensive. Better informed citizens make better informed representations, and this leads to collaborative, rather than combative engagement practices [8,12]. Providing stakeholders with greater understanding of the remit limits of a particular process also maintains stakeholder trust and future engagement with marine decisions. Public stakeholders are known to fatigue and withdraw from these quasi-democratic decision-making processes if their representations are not taken into consideration, as can happen if these representations are about matters not relevant to the current decision. For example, if concerns are about how often the bins are emptied at my local beach, and these are raised at a marine planning consultation, it may be felt that comments have gone unheard when in fact there is no mechanism for them to be heard in this arena. In this case, these concerns would, in other words, be raised with the wrong people but not being provided with signposting to the right avenue for concerns.

2.11. Process literacy and (marine) spatial justice: working towards ocean justice

From a more theoretical perspective, process literacy has important links to spatial justice. Building on the ontology of the social production of space [15] which defines being as inherently spatial, social and temporal, spatial justice starts with the principle that as we exist in space, our actions change space, and we are changed by space [30]. In both urban studies and law, spatial justice involves a 'struggle' towards equity in social space. Here, the spatial justice combines the distributive (equal/equitable allocation) and procedural (fair, and accessible, decision-making processes) aspects of social justice. For some this struggle is necessarily a conflict, hostility and power [25]; for others this struggle is more abstract and speaks to the process of (re)producing space in collaborative terms [16]. Spatial justice applies at a global scale, as well as thinking about space as an abstract concept. It is not bounded by territorial or urban limits. It also extends in time and allows for consideration of justice related to both past and future generations. Taking marine space as a social space, then, requires that citizens have access to decisions which impact it. Further to this, when citizens are excluded from (marine) decision-making spaces, injustice prevails. Process literacy, then, becomes a fundament requirement for (marine) spatial justice in that it provides knowledge, and therefore transparency and access to, these 'spatially productive decisions.

This lends itself to broader considerations of justice and equity gaining momentum within ocean discourse. For process literacy to have maximum impact as a core aspect of ocean literacy, the cultural, geopolitical, social and economic context must be considered within process literacy. Efforts to enhance process literacy as part of broader ocean literacy initiatives would need to be cognisant of some of the persistent issues around lack of equity and inclusivity which have been pervasive within ocean governance. Process literacy, therefore, needs to be considerate of unbalanced power dynamics and knowledge integration and sharing, and must work to address historical exclusions of customary and traditional rights holders and Indigenous communities. If these communities are excluded from the lawscape through a lack of process literacy on both sides, it further embeds exclusionary practice. This both inadvertently or consciously creates a divergence between the lawscapes and civil society, further disengaging already marginalised groups from the lawscapes and processes of decision-making.

Despite long recognised weaknesses in existing attempts to ensure meaningful public participation, it is of note that this position is enshrined within the 1998 Aarhus Convention principles of access to information, public participation and access to justice [9,27,31]. Providing opportunities for citizens to increase their process literacy -

and indeed for decision-makers to increase their understanding – therefore becomes a matter of moral importance. Exclusion from decision-making processes leads to unjust and inequitable decisions [2, 29].

3. Concluding remarks and recommendations

While the need for ongoing efforts to raise ocean knowledge and understanding should not be underestimated, enhancing ocean specific process literacy as an intentional component of ocean literacy is crucial for both increased ocean connection and understanding, and increased access to democratically derived decision-making processes and institutional systems. Marine space is planned and managed as a collective resource. In the UK this task is undertaken by public bodies, on behalf of the public - however, if processes are not accessible then they cannot truly be considered public. Where stakeholders, including the public, are excluded - inadvertently or not - from marine planning and decisionmaking processes, feelings of exclusion from ocean spaces are exacerbated. Thus, exclusion from marine decision-making processes greatly limits the capacity to build ocean literacy more widely. From a marine planners' perspective, increasing process literacy in stakeholders can provide an opportunity for increasing capacity and addressing resourcing issues through enabling stakeholders to better understand the processes and decisions being made and therefore engage in more meaningful and targeted ways.

From considering current practices within the UK, it is clear that even within expert groupings there are fundamental blind spots about how marine planning and regulatory decisions are made. This is evidence further in the tendency for academia to engage with "policy people", such as central government marine planners and regulators, then thinking about decision-making, rather than regulators, such as marine licensing staff, themselves. Indeed, a key part of building ocean related process literacy may be to illuminate the differences between the different aspects of these processes – e.g. the difference between marine planning, marine regulation, and other marine decision-making (in the UK this includes marine conservation and fishing regulation).

Process literacy in the context of ocean literacy involves increasing knowledge, understanding and access to marine planning and decisionmaking processes for stakeholders. But it also involves increasing knowledge and understand *of* stakeholders by marine planners and decision-makers. Care is needed to avoid making assumptions about the capacity and values of stakeholders and the general public or making moral claims about them. Understanding where stakeholders 'fit' in the wider process which is being operated within a marine planning or regulatory exercise is important for understanding why stakeholders may act the way that they do, and how their previous experiences, knowledge and agendas shape their engagement in the process. Through increasing this understanding, at wider systems level, marine planners, decision-makers and stakeholders can work together to create desired marine futures through coproduction and cooperation.

Given the recent momentum around the concept of ocean literacy, there is a clear opportunity to capitalise on the recent moment around the concept of ocean literacy and ensure that process literacy is integrated into ocean literacy discourse.

This will require academic engagement with marine planners and regulators to understand their perspectives on current processes and identify areas in which their process literacy could be increased. This may include wider thinking on democratic regulatory processes and environmental law. Applying the ocean literacy dimensions and, in particular, their alignment with process literacy, to the current marine planning regulatory regime in different jurisdictions would allow for increased understanding of best practice regarding how to make these processes accessible, and the benefits of doing this. Further to this, specific engagement with policymakers, both marine and wider environmental, would allow for consideration of how policy – and any associated guidance – can better support decision-making in terms of stakeholder engagement, access to knowledge, and cocreation of desired outcomes.

For general public and other stakeholders, increasing understanding of marine decision making, including marine planning, spatial regulation and how or when to get involved as part of ocean literacy initiatives. This would in turn improve process literacy through increasing knowledge in these stakeholders, communicating processes more clearly, and providing more transparent routes into engagement with marine planning and regulation.

Overall, a cultural shift in marine planning and decision-making is needed to facilitate meaningful inclusion of people [17]. In the UK, for example, marine planning under the Marine and Coastal Access Act 2010, is about to turn 15. Like all teenagers, marine planning is at an important milestone. It has gained much knowledge and experience and now needs to work on its confidence and communication in order to fully realise its potential as sustainably managing our seas. Ocean literacy offers a framework through which the complexities of marine decision-making and their impacts could be better understood across both sides of the process. While operationalising ocean literacy as a tool outside of formal education has been recognised as something of a challenge throughout the two decades since its inception [28], the intentional inclusion of these aspects of decision-making and governance process and, therefore the integration of process literacy, is one potential pathway to impact and to enhance the potential for ocean literacy as a meaningful policy tool [20,21]. Additionally, for ocean literacy initiatives to deliver against the aspirations of restoring human-ocean relationships, leading to transformational governance and acting as mechanism that enables this change, process literacy and its emphasis on building knowledge, capacity and access among different actors in the process will be fundamental - and must be prioritised alongside and in addition to aspects of ocean science that have been more traditionally included within ocean literacy initiatives. If we don't actively work towards democratising ocean governance in these ways, we condemn ocean citizens to engagement which feels like shouting into the void: their passion matters, we must harness it!

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McKinley Emma: Writing – review & editing, Writing – original draft, Resources, Conceptualization. **Fradera Kathryn:** Writing – review & editing, Writing – original draft, Resources, Conceptualization.

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Data availability

No data was used for the research described in the article.

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E. McKinley and K. Fradera

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