



Social Licence for Marine Conservation Science

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Marine environments are complex and dynamic social-ecological systems, where social perceptions of ocean stewardship are diverse, resource use is potentially unsustainable, and conservation efforts rely strongly on public support or acceptance. Decreasing trust in science in recent years has led to weakened social acceptance and approval of marine conservation science. Social licence is a concept that reflects informal, unwritten public expectations about the impacts and benefits of industry and government practises, including research, on natural resources, including the ocean. Working toward improving social licence may provide opportunity to bolster support for marine conservation, by allowing communities to engage with marine issues and marine science, and voice their concerns and views. Here, we argue that marine conservation requires social licence and we highlight science advocacy, accomplished through outreach, as a means to achieve this. We identify a role for marine conservation science to engage with the public through advocacy to improve understanding and perceptions of conservation. Drawing from the literature, we describe how science advocacy can enhance social licence for marine conservation research and outline four steps that can advise marine conservation scientists to achieve and promote social licence for their research and the wider marine conservation community.

Keywords: marine conservation, public perceptions, science advocacy, social licence, science communication

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INTRODUCTION

Marine environments are complex and dynamic social-ecological systems, where social perceptions of ocean stewardship are diverse, resource use is potentially unsustainable, and conservation efforts rely strongly on public support or acceptance. Globally, there is increasing awareness that society must be engaged in efforts to tackle marine conservation challenges. In parallel, there are increasing calls for scientists to engage more actively with society, to address publicly identified issues and questions and to improve perceptions of legitimacy of marine conservation science (Lubchenco, 2017). Trust always matters in the public sphere and whilst scientists may be regarded as “competent,” this does not infer that they are also considered trustworthy (Fiske and Dupree, 2014). Issues around the public legitimacy of science are not necessarily based around public ignorance or understanding of science (Kellstedt et al., 2008). Personal beliefs also shape public perceptions of science and are distinct from a poor, or lack of, understanding about science (Fiske and Dupree, 2014).

Social licence is a concept that may be used as a tool to incentivise the public to voice concerns on marine issues that may otherwise remain unnoticed or ignored (Cullen-Knox et al., 2016). To date, no consensus definition of the concept has been achieved however, we, in this paper, consider it “an unwritten social contract” (Moffat et al., 2015) that reflects broader community opinions and expectations on the impacts and benefits of industry and government practises, including research (Edwards and Lacey, 2014). Social licence provides opportunity for ongoing engagement and two-way negotiation with the public and thus, reflects the “changing strength and quality of acceptance and approval afforded by a community of stakeholders” (Hall et al., 2014). The concept is now considered essential for successfully establishing and running natural resource projects (Hall et al., 2014) and may have potential to foster engagement and stewardship in the marine space and for ocean conservation (Kelly et al., 2017).

Social licence is founded on meeting diverse and dynamic community (stakeholder) expectations, solid relationships and meaningful communication (Hall et al., 2014; Rooney et al., 2014). In exploring its use in marine conservation science, the need for social licence can necessitate the practise of effective scientific communication (Gallois et al., 2016), which can bolster outreach and advocacy efforts. Opening public discussion and providing more accessible scientific information can improve trust and strengthen relationships with society (Mason et al., 2016), and science advocacy is a means of public engagement that can improve public awareness of, and trust in, science. In this paper, we define science advocates as people who work for a scientific cause or group, and who engage in science outreach activities to inspire and teach about science (Carney, 2014).

Whilst social licence for conservation has been discussed in the literature (i.e., Kendal and Ford, 2017; Garnett et al., 2018), to date and to our knowledge, no literature has discussed a need for marine conservation scientists to “earn” social licence. Certainly, decreasing trust in science has weakened social acceptance and social licence for marine conservation and science in recent years, and scientific priorities are often misaligned with marine stakeholder priorities (i.e., Mason et al., 2016). Within science culture, scientists’ engagement with society is often viewed as an inferior pursuit to research (Martin, 2017). The prevalent “publish or perish culture” commends academic accomplishment over public engagement when allocating tenure, and this is a structural limitation for scientists who recognise the value of public science engagement, but who will receive no accreditation for their efforts.

Another hurdle for scientists willing to engage is that scientists are trained to communicate their research via “the scientific method” (Green et al., 2018) and as a result, the readability of scientific papers is decreasing over time (Plavén-Sigra et al., 2017). Acknowledging uncertainty in research outputs is also a practise that is inherent to science, but which can diminish the perceived public legitimacy and authority of science (Zehr, 2000). The communication of marine conservation science will inevitably involve uncertainty and marine scientists should be aware as to how this can potentially undermine public incentive to respond to threats and deterioration in

the marine environment. Scientific uncertainty may promote public disengagement and the deference of any responsibility and urgency for action (Morton et al., 2010).

Marine conservation scientists should not assume that the “public” (typically including coastal and fishing communities, indigenous groups, policy makers and others) share their world views and assumptions about marine environments and resources (Kohler and Brondizio, 2017). Gaps are often apparent between the public’s and marine scientists’ perceptions of threats to the marine environment (Lotze et al., 2018). Societies’ lack of trust in expertise of all kinds, including science and government, has heightened globally in recent years (Nichols, 2017), with academics and their institutions regarded as ivory towers conducting research in isolated realms. Suppression and distrust in science is a global phenomenon and conservation science is increasingly seen as irrelevant (Parsons et al., 2015). Modern marine conservation challenges demand a “hands-on” approach, whereby scientists can respond to public needs transparently (Lubchenco, 2017).

The vast majority of marine science remains outside the public’s direct experience and the public depend on other parties to inform and guide them in their interpretation of ocean science. Whilst science communicators have an invaluable role to play in science outreach (which we discuss below), scientists must also communicate their science to earn and maintain public trust. Third-party communication distances the public from science and may create distrust. Further, scientists risk their message being lost or miscommunicated by messengers who might not understand the true complexity of the science, or the importance of framing issues in context. Science outreach and advocacy, by marine conservation scientists, can engage communities in marine issues, and improve their perceptions of marine science and conservation.

Science outreach, more generally, centres around building capacity, fostering trust and developing scientific understanding (Varner, 2014). Science advocacy employs outreach, but focuses on ensuring that specific scientific outputs are shared with relevant people (i.e., a targeted “public”) in formats that are clearly understandable to them (Parsons, 2013). Advocacy can be considered a more personal means of communication because scientists can voice personal elements of their work and research to form a connexion with the public, and build trust through this relatedness and transparency. Science advocacy may provide a means to build rapport with society and elicit a connexion, to earn legitimacy, support and thus, social licence for marine conservation science.

Science outreach and advocacy can also substantially impact upon scientists, who become more aware of public views relevant to their own science, and gain a variety of skills not formally taught in degree training (Beck et al., 2006). Further benefits may incentivise marine scientists to engage in outreach and advocacy activities. For example, the March for Science recognises this need for publicly communicated science and has become an international “force for science advocacy,” that champions the role of science, to ensure its role and relevance in political decision-making. Scientific research remains largely publicly funded and society expects that its investment in science will

yield the best science available, to produce something useful (Lubchenco, 1998). Outreach and advocacy are necessary to ensure that the public are informed about this best and useful science, and public engagement is increasingly an obligation for scientists. This is evidenced by funding schemes, such as the Australian Research Council's National Innovation and Science Agenda, which require supported researchers to engage with the end-users of their science.

Modern scrutiny of science requires scientists themselves to earn credibility. The ocean is often considered the “next frontier” of conservation but activities in conservation increasingly require public support and social licence to be successful (Bennett, 2018). Here, we argue that marine conservation requires social licence and that science advocacy (via outreach by marine conservation scientists) may provide a means to achieve this. We identify a role for science advocacy to enhance social licence for marine conservation research and highlight four key steps that can advise marine scientists to achieve and promote social licence for the research that informs and underpins marine conservation.

While not all scientists can, will, or need to engage in outreach and advocacy, marine conservation science in particular, as a field that is so germane to communities, needs to promote its research more clearly to the wider public. Developing respectful dialogue with society may allow marine conservation scientists to earn respect as a source of factual information and expertise. Passionate workers in their respective fields, many conservation scientists are likely already advocates without realising it (Parsons, 2016). Sharing this passion and advocacy with their wider community can enhance their credibility and promote social licence for marine conservation science. Below, we elucidate four steps for marine scientists to advocate their research, and build social licence for ocean research that underpins marine conservation.

ENGAGE WITH OTHER DISCIPLINES: APPRECIATE THE VALUE OF SOCIAL SCIENCE

The need for social licence highlights the important role of human dimensions and public perceptions in conservation (Kendal and Ford, 2017). A scientifically engaged society can empower and incorporate the public in constructing democratic, scientifically informed governance and decision-making, and this promotes social licence for science. The vast majority of marine conservation science occurs outside of the public sphere and the public depend on other parties to explain and guide their interpretation of marine science. We cannot expect that marine scientists and conservationists can expand their skills toward understanding public perceptions of science, and conducting science advocacy in response, on their own. Multidisciplinary discussions with social scientists, natural scientists, educators, psychologists, conservation marketing and others can connect diverse perceptions to enhance communication on marine conservation science and practise. Public perceptions research may be a valuable source of information to identify and understand society's diverse

interpretations of marine science and conservation (Jefferson et al., 2015).

Interdisciplinary marine research is becoming more prevalent (i.e., Thébaud et al., 2017; Alexander et al., 2018). Marine protected areas research, as an example, has evolved from managing areas for biological conservation, to also incorporating social dimensions that promote sustainable resource protection adaptive to social and ecological needs (Agardy et al., 2003). Interdisciplinary marine research, similar to science advocacy, is not without its challenges (Alexander et al., 2018). However, interdisciplinary training (or at least, understanding) is a tool that allows a new generation of researchers to reconsider their research objectives, adopt new approaches that compliment other spheres of research and enhance socio-ecological outcomes that can promote social licence for marine conservation science. Early-career researchers are increasingly educated and encouraged to conduct more applied research, to collaborate across disciplines and to engage with local communities. Certainly, the global conservation community is adopting more collaborative and integrated approaches for conservation (Bennett and Roth, 2018) and there are increasing opportunities for researchers to collaborate across disciplines and with society, including workshops, summer schools and conferences, such as International Marine Conservation Congress.

UNDERSTAND THAT SCIENCE HAS MULTIPLE AUDIENCES: THERE IS NO “GENERAL” PUBLIC

The public funding that supports most scientists infers a social responsibility to address public needs and to share science with society to maintain a “social contract” or social licence for their research (Lubchenco, 1998). Be it with policy-makers or the public, scientists should acknowledge that scientific language can have variable applications and consequences, dependent on communicator, audience, and context (Gallois et al., 2016; Drakou et al., 2017). Jargon and slang can produce wedges of misunderstanding, not only excluding stakeholders but also eroding trust between them (Mason et al., 2016).

Effective communication requires speaking in “languages” that people understand, it is based heavily on trust and thus, scientists are required to communicate clearly and honestly (Cooke et al., 2017). Marine conservation scientists, perhaps more than other scientists, should to be willing to “leave [our] comfort zone behind,” to communicate across different languages, research in new circles and welcome other opinions (Mascia et al., 2003). Marine conservation scientists can create and adopt new languages and in some cases, let go of their familiar definitions and assumptions and work to accept ambiguity, if this can create positive engagement with science (Fleming and Howden, 2016). For instance, improving the accessibility of scientific writing, to a range of audiences with different needs, can boost the impact of academic publications in a practical and applied sphere outside of the lab (Doubleday and Connell, 2017).

Inaccessibility is an oft-cited reason for lack of trust in information, particularly digitally available information (Hart and Liu, 2003). The online scientific newspaper “The Conversation” is a platform which allows scientists (and others) to communicate their research in easily-understandable formats, as a freely available resource. The paper’s growing readership is indicative of the public legitimacy and trust it has achieved since its development. Marine conservation scientists, for example, can work to increase their relevance and legitimacy by sharing their science, via adapted research papers, with a broader public readership.

Marine conservation scientists should also be aware that online platforms continue to alter the means by which public information is accessed and opinions are formed. The internet has become the “go-to” and preferred source of public information on science. Online users are observed to focus on limited sets of websites and entrench themselves within distinct online communities, or “clusters” (Schmidt et al., 2017). This promotes “confirmation bias,” the tendency for people to seek out and register information that confirms their worldview and ignore contradictory information, which can influence public perceptions of science (van der Linden et al., 2017). Meaningful, understandable and open scientific discussion with the public is necessary to maintain social licence than can evolve with society.

IMPROVE SCIENTIFIC TRANSPARENCY: OPEN SCIENCE TO THE PUBLIC

Science is founded on objective observation and description of the world around us and advocacy is tightly linked to subjective views and values on how that world should be. Yet, marine conservation scientists can engage in science outreach and advocacy without risking their scientific credibility or that of their scientific method (Kotcher et al., 2017). A large proportion of the public do want to know about science (Searle, 2014) and scientists could share their research through means that are more publicly accessible. Scientific communication that is fact-based, transparent and open can provide a tool for scientists to improve public understanding and appreciation of marine issues, without ever requiring persuasion.

“Proactive, persistent, clear and resonant messages are required” to promote trust in science (Gropp, 2017) and there are myriad ways that scientists can open science to the public. For example, Massive Open Online Courses (MOOCs) are free, open-enrollment web-based courses that are a resource for the public to learn about science directly from scientists. These courses provide a flexible way for the public to improve their own scientific knowledge, learning directly from experts from a wide range of scientific fields. MOOCs also facilitate scientists’ ability to engage with large groups of interested public, often from the comfort of their own office.

“Skype A Scientist¹” is another initiative that links scientists to classrooms and students across the globe. Its aim is to link

¹skypeascientist.com

students to “real scientists,” to improve their understanding and appreciation of science and to interact with scientists. “Let Science Speak²” is a similar online platform that aims to “humanise and amplify the voices of real scientists.” It provides public science information in various forms of media, including short videos, podcasts, editorials and social media, and aims to educate the public about current science and to foster support and social licence for scientists and their research.

Marine conservation scientists may also engage the services of professional science communicators, to inform themselves on best available knowledge and practise for disseminating their research, and which can save time for pursuing their important research further (Illingworth, 2017). Professional science communicators are qualified professionals who understand the need to address the context of particular marine science issues, and best means to connect these messages, to their public audiences. Whilst science is the focal message, the delivery and the messenger are also factors supporting the (un)successful uptake of information by any public audience. Engaging the public in science can provide a means to achieve a more ocean literate society and enhance marine citizenship, stewardship and social licence for marine conservation (McKinley et al., 2017).

DIVERSIFY PUBLIC OUTREACH: THERE ARE INFINITE WAYS TO ENGAGE AND COMMUNICATE

Public platforms that encourage exchange of opinions and concerns (i.e., participatory meetings, citizen juries, MSC Certification for fisheries, opportunities for engagement with local government) are necessary to engage society and to promote social licence for marine conservation science. Science education in schools, which involves marine scientists in outreach and teaching, can also play an important role in enhancing ocean citizenship and literacy and public support for conservation science. Targeted events, such as “science camps,” considerably increase youth interest in marine science and champion science as an acceptable and viable career path (KatarzŹyté et al., 2017).

As highlighted above, the internet is the preferred source of public information on science, thus, it is a valuable media on which to engage and communicate with the public. The #OceanOptimism campaign is an example of active public engagement on marine conservation science issues which aims to demonstrate that not all ocean news is “doom and gloom.” The movement shares positive information about successful marine conservation efforts, including an online “monthly round-up” of positive ocean news. This collaborative movement has been hugely successful in communicating science to the public and to date, the hashtag has been seen by over 74 million internet users³.

Informal outreach can also be effective. For example, Science in the Pub is an Australia-wide initiative that brings evidence-based research to an interested public, who “weigh

²letsciencepeak.com

³oceanoptimism.org

the evidence...with beer.” Citizen science is another rapidly expanding phenomenon that can influence research questions and provide the public with a voice in local environmental decision-making (Bonney et al., 2016). Recent developments in citizen science have bolstered projects’ abilities to reach and inform wide audiences on important local, national and global issues, including marine debris, ocean plastics and climate change (Nurse-Bray et al., 2018) and actively engage the public in marine conservation science. Citizen science may be instrumental in “breaking down the barriers” between science and the public (Vann-Sander et al., 2016), improving science literacy, enhancing legitimacy of science (McKinley et al., 2017) and promoting its social licence.

CONCLUSION

The need for social licence for marine conservation, and the science that informs it, necessarily opens science to the public. Scientific impact is not only a function of economic and industrial interests and uses, but of social factors too. Marine conservation science should demonstrate itself legitimate, credible and trustworthy because positive public perceptions

of science are required to ensure it is relevant and robust. Undoubtedly, the public hold some responsibility for informing themselves about science. However, we argue that scientists can engage and appeal to the public, by advocating for marine conservation science and highlighting issues and threats to the marine environment.

Given the “wicked” complexity of most marine environmental problems and conservation challenges, adequate communication and cooperative effort between researchers from diverse disciplinary backgrounds is the way forward and time is of the essence. Marine conservation science needs social licence. Marine conservation scientists can engage and gain public support for their research and the conservation of marine spaces, systems and resources.

AUTHOR CONTRIBUTIONS

RK is the primary author and this work is a component of her Ph.D. thesis. AF and GP are her two supervisors and contributed to conceiving the topic of this paper and the development of the argument and writing.

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