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Editorial: Contemporary marine science, its utility and influence on regulation and government policy

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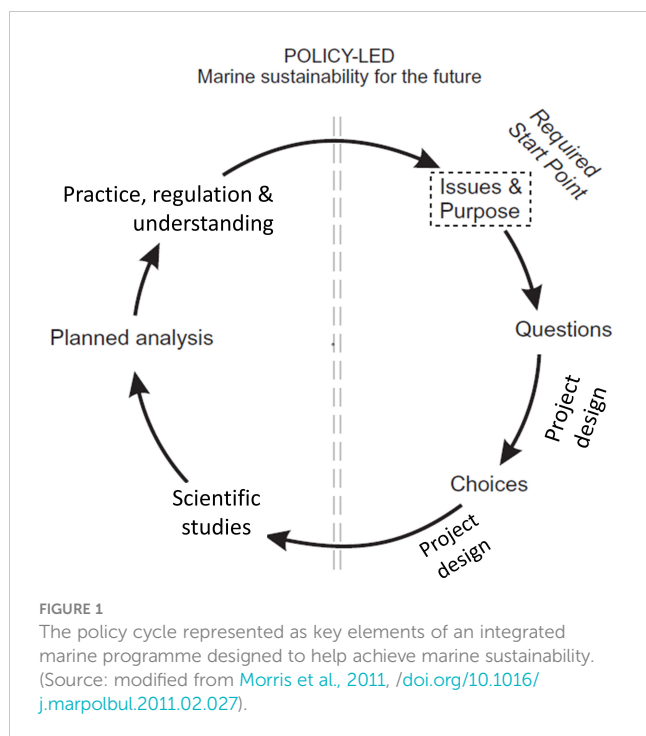
Editorial on the Research Topic

Contemporary marine science, its utility and influence on regulation and government policy

The purpose of this Research Topic is to evaluate the quality of contemporary marine science and to examine relationships between science, regulation and government policy in the marine environment. The quality of marine science matters; not just to advance knowledge on understanding marine ecosystems, but also to guide marine management. Marine environments are increasingly the location of a wide variety of human activities, all of which are subject to design- and risk-related research, and a range of applied science. Our motivation for hosting this Research Topic is a concern as to whether the most appropriate science exists and is being used to underpin regulation and policy in the most effective manner.

The range of papers received reflect the breadth and complexity of the topic. The types of marine development considered by the papers ranged from the generic to the specific with respect to offshore renewables, marine archaeology, fisheries, and ballast-water treatment. In this editorial, to describe these contributions, we use the various phases of an integrated marine programme designed to help achieve marine sustainability (Figure 1). Given known issues and overall purpose (including sustainability), the process begins with identifying general questions, followed by the choice of specific scientific questions to be answered (not just ‘addressed’). These questions then drive the choice of integrated services (scientific studies) to collect appropriate data and information, which together form the basis for an analysis and increased understanding of marine sustainability, and so around the circle again, improving understanding with each cycle.

Taken together, the Cormier et al. papers cover most aspects of this cycle. Cormier et al. focus on “science used for technical measures” that appear in codes of practice, guidelines and regulations (“practice, regulation and understanding”) asking whether the outcomes of technical measures meet the expected outcomes. Cormier et al. focus on different scales at which ocean impacts might be viewed and how such scales inform legislation and administrative structures. They note that “marine management implies that the spatial



and temporal scales of management are understood and built into prevailing legislation and administrative structures”, a position expounded upon by Cormier et al.

The significant time lags involved in the processes of publication, scrutiny, and acceptance by the science community can obfuscate an understanding of these scales, so that regulations are always far behind the established science and further behind the latest evidence (Morris et al., 2011). Time lags can lead to collective inaction and might be part of the reason for the occurrence of Schwenkenbecher et al.’s “status quo” bias. Their work focuses on the philosophical underpinnings, including psychological traits, behind cases where there is limited empirical evidence to help form the specific purpose of work, and they include useful considerations of bias in evidence.

Such an environment where information is lacking is the deep sea, where the advent of likely mining activity is noted by Christiansen et al. The regulatory need to focus on ‘baselines’ leads the authors to the pertinent question of what defines a “baseline study”, and they present suggestions for criteria to help assess the quality of scientific studies. In these deep-sea systems, natural variability is poorly known, so the authors indicate the primary need for spatial mapping and time-series measurements that include sediment cores, to help assess the various timescales of change. The choice of representative control sites and the significance of before-after comparisons depend entirely on such data, applying equally to shallower marine environments.

Similar points are made by Ward et al. regarding the need for greater awareness and integration of archaeology and cultural heritage management with marine sciences—especially the physical sciences. Issues of spatial variation and temporal change also arise here, especially concerning the project design and scientific study

aspects of Figure 1, the key issues of Indigenous knowledge, and the importance of developing co-designed and -led projects and cultural management. On overlapping themes, Hewitt et al. describe a series of existing barriers to the effective use of science (in New Zealand), advocating that education of various sorts across society and within the relevant organisations is the prime avenue of improvement.

Although there is a large literature upon submarine pipelines, Griffiths et al. demonstrate that the default transfer by regulators of this literature for use in offshore renewable development (e.g., submarine cables) is inappropriate, posing a variety of attendant risks. Regulators need to commission work to develop relevant guidelines for this burgeoning industry to support understanding of the risks and ensure effective and defensible regulation.

The need for the updating of policy and regulation is a common theme in this Research Topic, with another example being the work of Gozzer-Wuest et al. The authors examined the priorities for fishing policy reform (in Chile) and the need for a national research agenda to improve fisheries management, finding that current laws and policies need updating. A similar conclusion is arrived at by Nie et al. in their assessment of the costs of compliance with different ballast water management policies.

Collectively the papers in this Research Topic showcase the important role that marine science in general and the scientist authors in particular can play in informing and guiding marine policy and practice. The relationship between science, regulation, and community acceptance is an ongoing issue warranting vigilance and ongoing attention. As the papers in this series indicate, ultimately rigour and credibility through evidence-based policy making is not only possible but essential in the quest for sustainable marine development and management.

Author contributions

PL: Writing – original draft, Writing – review & editing. AM-S: Writing – original draft, Writing – review & editing. PR: Writing – original draft, Writing – review & editing.

Conflict of interest

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Reference

Morris, D., O'Brien, C. M., and Larcombe, P. (2011). Actually achieving marine sustainability demands a radical re-think in approaches to monitoring, not 'more of the same' (Viewpoint Article). *Marine Pollution Bulletin* 62, 1053–1057. doi: 10.1016/j.marpolbul.2011.02.027