MarXiv Summary

MarXiv: The free research repository for the ocean & marine-climate sciences

Journal paywalls impede scientific information from being used for ocean management.

Main Findings

This study of MPA management plans in three countries found that primary scientific research from journals represented just 14% of the information cited in the plans. A main reason for this shortfall was that most journal articles were behind paywalls, where managers had no access to them. This study was the first to document the impediment that journal paywalls present to marine management and to effective application of science for conservation.

Lead author Chris Cvitanovic is a Research Fellow at the Centre for Marine Socioecology at the University of Tasmania, Australia. He specializes in knowledge exchange, stakeholder engagement, and the governance of marine resources. Previously he worked for 10 years in Australian government, first with the Department of Environment and then with the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Please tell us about the research, Chris.

Chris Cvitanovic: What this research set out to do was to understand how accessible, or inaccessible, science was to different end users in marine management, particularly to people not based in research organizations. So we looked at things like whether the science was open access or paywalled; how easily interpretable it was; how long it took to get the science published after data were collected; and things like that.

What are the implications for marine practitioners?

When we did the study I was working for the Australian Government's Department of Environment as the science manager for their Marine Protected Area Program. A key part of this role was staying on top of the science to understand what we knew, and what we needed to know. But there were a range of structural barriers that made this really challenging, like the ones we report in the paper. So for my colleagues and me, the study validated a lot of what we already felt about science accessibility but which had never really been written down in our field. It made us feel like our concerns in this space were legitimate.

So you weren't surprised by the findings of the study?

At the time, no. They really just validated a lot of what I was living in my day-to-day life working in a government agency. But if you had asked me this before joining the Australian Government, I would have been very surprised.

I was originally trained as an ecologist and I worked with a lot of people who I really respected – really senior ecologists. Time and again I'd be sitting on a beach with them after fieldwork talking about marine conservation and management and I'd constantly hear things like, "We have so much knowledge, but policy-makers don't understand how the real

This is a summary of:
Utility of Primary Scientific Literature to Environmental Managers: An International Case Study on Coral-dominated Marine Protected Areas

Accessible at:
<https://marxiv.org/hv4da>

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world works. All those bureaucrats in Canberra are so disengaged from it all.” Being young and impressionable, the more I heard this the more I believed it, and that was exactly why I joined government. I went into it with that mindset that government workers had no idea, and I was going to change that.

But to my surprise, I quickly learned that government workers were actually really capable and savvy, and most worked incredibly hard. Perhaps more to my surprise I also learnt that most government officials in the Department of Environment had the same values as a lot of scientists in the environmental sector. In fact, they wanted the same outcomes as scientists – to protect and conserve the marine environment – they just operated in a different system. So although I went into government thinking, “They have no idea,” when I got in there I quickly realized, “No, they’re really trying, but there are all these structural impediments – like accessibility of science – that really limit how they can do it.”

For example, when I was in the Department of Environment, if there was a peer-reviewed journal paper that I wanted, I could email our library and request a copy, and they would then request it from elsewhere. It might take a day to arrive; it might take two months to arrive. In the world of policy, you can’t wait two months to answer a question that needs answering now. You could have the Minister’s office on the phone saying, “We need a policy brief tomorrow on this topic.” So having a structural impediment to getting the information you need makes the job really bloody hard. You can only do the best you can with the resources you have available to you.

So I wasn’t surprised by the study’s findings when I was working in government because I was living it. These were the barriers I kept coming up against. These were the barriers my colleagues were coming up against. With this study, we just wanted to quantify it in a way that would help scientists understand some of the challenges that we were facing.

The ironic thing about this paper is that, because I had no funding for the research at the time and did it just as a hobby on the side, I couldn’t afford to pay the fee to make it open access [free to users]. So this study that recommends open access papers was itself not open access. It’s a terrible irony that still haunts me. People are always reminding me.

What advice do you have for scientists and practitioners?

This is something I get asked a lot, and unfortunately there is no silver bullet, no one-size-fits-all approach. There never will be.

But there are things we can do that will help. For example, I think we can make more progress if we get away from the terminology of ‘they’re a producer of knowledge’ and ‘they’re a user of knowledge.’ We all have knowledge. For example, practitioners have experiential knowledge that scientists need to appreciate and account for. So, from my experience, implementing a more participatory approach to research – allowing the knowledge bases of all actors to be incorporated into the outcomes and outputs – can be productive.

I also think we need to reimagine professional development and training for scientists, and particularly our early-career scientists. Almost every early-career scientist I talk to is interested in generating real-world impacts from their research, and for many this is one of the main reasons they pursued a career in science. But they don’t know where to start to generate impact – they’ve never been taught these skills. So we need to rethink how

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we train and develop scientists, and help them to gain practical insights and experience not only in their scientific discipline, but also in policy engagement, outreach, and impact.

Closely related to this, I think we need to change the way we fund research. If you receive a million dollars for research – even if there's language that some societal impact is expected – all the funding typically gets applied to the research with societal impact as an after-thought. I think we need to rethink how funders allocate their money, and have a separate bucket of cash for research and a bucket for engagement and outreach to ensure that it happens. Furthermore, at the risk of making me unpopular among many scientists, I also think that funders need to make researchers more accountable to delivering the impacts they say they will. In many cases at the moment, at least from my experience, this is just a tick-the-box exercise.

Finally, the single most important thing I've learnt so far in my career is the importance of values and worldviews. As I said earlier, my experience tells me that most environmental scientists and decision-makers have shared values – a desire to protect the marine environment. If we use these shared values as a basis for our relationships and engagement efforts, we can move forward together and enable a more productive relationship between marine science and decision-making.

Editor's note: We selected Utility of Primary Scientific Literature to Environmental Managers: An International Case Study on Coral-dominated Marine Protected Areas as our first paper to summarize because its findings were instrumental to MarXiv becoming a reality. After several years of running OpenChannels.org, the community hub for sustainable ocean management and conservation, we picked up on a number of patterns. One of which was that important research being discussed in the academic community was not being used for "on-the-water" ocean management. We did a literature review and this paper was, at the time, the only one we found with a likely answer. Since then, Chris has continued research on this subject – but we thought it was necessary to start from the beginning, which is why you may be surprised to see a paper from 2014 being summarized almost four years later. We are very thankful to Chris and his collaborators for continuing to shed light on this important topic.

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