



How To ... Make Your Research Relevant for Fisheries Management

Overview

For many of us who have joined or wish to join the world of fisheries research, our goal is to make a difference in fisheries management and/or fish conservation. Often times, we get bogged down in our thesis work and forget about the big picture, and how our research findings fit in to the ‘big picture’. If one of your goals is to be relevant and strive to make your research relevant, read on!

A group of graduate students, with input from senior researchers, have compiled a list of “practical guidance for early career scientists interested in solving conservation problems” (see box, Chapman et al. 2015). In this “how to” series, I highlight some of their perspectives and provide perspectives from my own experiences. I have taken their advice and created four generalized categories on “how to be relevant to fisheries management”. These are meant to be suggestions and not a comprehensive list of strategies to be relevant.

Section	Strategy	Take Home Message
2.1	Take off the blinders	Maximize conservation impact by knowing the appropriate scale of a project
2.2	Evidence matters but comes in different forms	Integrate different forms of knowledge to increase scope of conservation initiatives
2.3	Don't be parachute scientist	Maintain positive relationships with locals in areas of conservation concern
2.4	Failure: a viable outcome	Understand that outcomes have important lessons and strengthen conservation science
2.5	Creativity ain't just for artists	Don't be afraid to step outside of your comfort zone and be creative
2.6	Everyone's a scientist	Understand the potential of citizen science and community engagement
2.7	Breaking "bad" behaviour	Encourage pro-environmental behaviours through example
2.8	Build bridges, not walls	Cross disciplinary boundaries to form integrative conservation approaches
2.9	Money talks	Be willing to view conservation through an economic lens
2.10	Start with a partner	Involve practitioners and policy makers from the onset of a project
2.11	Techno-fix or tech-no-fix?	Embrace and account for the inherent limitations of new technologies
2.12	Be in the node	Know how to network effectively and in a variety of forms
2.13	Move beyond "the sky is falling"	Maintain a positive outlook to prevent becoming disenchanted with conservation science

1. Are Your Research Questions Relevant?

Being relevant starts with your research questions. To ensure that your questions are relevant and useable to fisheries management, you need to ‘start with a partner’ (Strategy 2.10 in Chapman et al. 2015). Scientists and practitioners (e.g., managers, policy makers) work in two different worlds and two different cultures with differences in time frame, priorities, incentive systems and demands. To ensure your research findings are relevant, there is a need for a co-creation of the research agenda between the scientists and those who will use that knowledge (Roux et al. 2006). Graduate students and early career researchers have the greatest opportunity to bridge the research-action gap as they are in their formative years and can include early input and collaboration from practitioners into their research questions/agenda. This can lead to producing effective and relevant findings that address ‘real’ problems that practitioners are facing (Chapman et al. 2015).

2. Who Are You? Can You Be Trusted?

Working in the field of fisheries management and research does not mean you are working only with fish. Fisheries have the potential to exist anywhere humans and fish interact, thus humans make up a significant part of fisheries management. That being said, being relevant to fisheries management and to user groups is a social process. It is human nature to judge where the source of information comes from; therefore, you as a research scientist will be judged on your credibility and reliability, which leads to whether someone will trust the information you offer.

2.1 Don’t be a Parachute Scientist

To gain credibility, you should ‘not be a parachute scientist’ (Strategy 2.3, Chapman et al. 2015). Emerge yourself into your study system. Do not disregard local conditions and/or knowledge. Building strong relationships with the local community and those who are directly affected by your research is essential to gaining trust and credibility. Engage locals who have a wealth of historical knowledge concerning fish and fisheries of the study system and use local ecological knowledge whenever possible whether it’d be formally or informally. Do not drop in like a parachutist and leave without building a long-lasting positive relationship with the community (Chapman et al. 2015). This can have a long lasting impression not only for you but for the scientific community as a whole.

2.2 Be in the Node

By ‘being in the node’, you make a presence for yourself in your field with the users of your research findings (including your peers) and facilitate connection among multiple otherwise disconnected networks (e.g. interdisciplinarity). Effective networking was recently listed as one of the top skills for non-academic job descriptions in science (Blickley et al. 2013). Many graduate students and early career researchers lack the knowledge and skills to effectively network, and some choose not to participate in networking at all. Networking is a significant activity for your credibility and for the dissemination of your research findings. Because of the proliferation of social media, Twitter and Facebook have become a hotspot for scientists to share

journal articles. Other media including LinkedIn, academia.edu, and ResearchGate are now leaders in professional social media sites that give early career researchers an opportunity to be known and to share their knowledge. Networking is the mechanisms that fosters collaborations. Take the opportunities at conferences, meetings, and on social media to build your network, and let people know who you are.

3. Take a Look Around

As graduate students, early career researchers, and even as senior academic scientists, we often get bogged down with thesis work, course work, teaching, and the pressure to publish that we lose sight of the big picture and what's around us. Data generated from our research is critical to advancing knowledge, and to use that knowledge to find meaningful solutions to issues in fisheries science. However, this is only one piece of the puzzle. Fisheries is extremely complex to understand and inherently crosses disciplines and scales. By 'taking off your blinders' (Strategy 2.1, Chapman et al. 2015), you can take in a variety of aspects surrounding your research question or issue. This is necessary to ensure the goals of your work remain relevant within the research and political framework.

3.1 Matching Scales

As fisheries research scientists, we often focus our attention on lower level scales (restricted sample size, local study site, limited replication, individual level, constraints by political and budgetary cycle, etc.); whereas fisheries managers and policy makers look at fisheries problems at higher levels (e.g., fish population level, cross jurisdictional, political and institutional scales; Cash et al. 2006). When using data at a lower (micro) level process to explain a higher (macro) level process, biases can be introduced and nuances in the data can be left out (Gibson et al. 2000, Chapman et al. 2015). This introduces uncertainty in the research and can be a reason for lack of integration of scientific knowledge within management (Sutherland et al. 2004). Therefore, it is important to acknowledge these shortcomings and mismatches between scales when they exist. But by considering the appropriate scale when designing your research, you can limit this uncertainty and maximize the relevance of your findings (Chapman et al. 2015).

3.2 Build Bridges and Be Interdisciplinary

The complexity of fisheries also leads to the dilemma that it cannot be addressed with one single lens, discipline or perspective. By 'building bridges, not walls' (Strategy 2.8, Chapman et al. 2015), and venturing beyond disciplinary boundaries, you can bring together more pieces of the puzzle and gain a larger perspective of the big picture. Don't lose sight of your expertise, but be open to complementing your work with other expertise (e.g., social sciences, economics, non-scientists, traditional knowledge, etc.) through collaborations and investing time in understanding different perspectives and how it fits into the big picture. Start thinking about fostering interdisciplinary skills and seek collaborations when challenges arise (Chapman et al. 2015). The saying that 'money talks' or 'money makes the world go around' exist for a reason (Strategy 2.9, Chapman et al. 2015). You should learn to understand how the

economy influences your work, how that in turn influences the priorities of government and of society. Be open to viewing the problem from an economic perspective as well.

4. Mobilizing Your Work and Communicating Its Relevance

At the end of the day, why did you do all that work if no one will read it or use it? These are some thoughts that I have had, and likely some of you have had. We know it is our responsibility to disseminate our findings, but how can we do this in a relevant and effective manner? Ask yourself: Who cares about the research you did/doing? Why is it important? Who does it affect? Know your audience and know why your research is relevant to them. Know what difference the research can make, to whom, and who has the power to implement changes. Know what your key messages are and what the goals are when you intend to mobilize your findings.

4.1 Science Communication is a Two-Way Street

Science communication has often been seen as a one-way process, i.e., find ways to bring the science to the people! However, it should not be a one-way street. As previously mentioned, engaging users and the audience and getting feedback is essential as it builds relationships, credibility, and trust in what you have to say. There are a multitude of ways that you can deliver your message ranging from traditional conferences and meetings to new forms such as social media and documentaries. By knowing your audience and what the intended goal is for communication your research will help you decide how and when to mobilize or communicate your research findings.

4.2 There Isn't ONE Right Answer

Furthermore, 'evidence matters but comes in different forms' (Strategy 2.2, Chapman et al. 2015). The traditional scientific method is one way to come up with evidence, but it is important to acknowledge that not everyone involved in a given fisheries problem is a scientist, and different worldviews exist. To some, evidence comes from an 'expert', and to them an 'expert' may mean something completely differently than how you or I would define experts. Traditional and local ecological knowledge is a form of evidence that is valued and is the truth to some. Again, be aware of the varied forms of knowledge, evaluate them yourself, and incorporate them if you see it fits. By being interdisciplinary and being able to work with diverse worldviews will stimulate creative solutions and make you and your work more relevant.

4.3 Be Creative and Take the Leap

'Creativity ain't just for artists' (Strategy 2.5, Chapman et al. 2015). Do not be afraid to be creative. There is a call for early career researchers to foster creativity in order to adapt and tackle complex problems in this rapidly changing world. Training yourself to be creative exercises your brain to innovate and adopt novel approaches to problems. Being creative doesn't mean being able to make pretty, animated presentations, it can also mean immersing yourself with people with varied backgrounds to generate and foster new ideas (Paulus 2000, Chapman et al. 2015), or simply taking risks by experimenting and trying something different.

Final Remarks

Many of the strategies suggested here and by Chapman et al. (2015) are not meant to be daunting or take away time from your research. They are meant to complement and enhance both the product of your research and your research experience as whole. It boils down to simply reframing how you think and approach to problems. Do not shy away from people whether they are local communities, your scientific peers, practitioners, etc., but rather embrace their perspectives and understand their worldviews as this will make a world of a difference in how you will approach your work and improve its relevance within the big picture.

Good luck!

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