CHAPTER SIXTEEN

Citizens and science: media, communication and conservation

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16.1 Introduction

In 2016 a full-page advertisement was placed by 56 Australian scientists in the Brisbane *Courier Mail*. The context of the advertisement was the continuing commitment of Australian governments, federal and state, to coal mining and coal-fired power stations despite overwhelming evidence connecting this activity to the severe damage being suffered by the Great Barrier Reef (Hoegh-Guldberg, 2015). As well as presenting their scientific credentials in the advertisement – together they had devoted more than 1200 years to studying climate change, marine ecosystems and the Great Barrier Reef – the scientists prioritised the Reef's economic value over its conservation values. The burning of fossil fuels, they wrote, is 'directly threatening a major economic resource. The World Heritage listed Great Barrier Reef earns multiple billions for the economy and provides jobs to tens of thousands of Australians' (*Courier Mail*, 2016). '[T]here can be no new coal mines . . .', the scientists demanded, and 'No new coal-fired power stations'.

This attempt to influence public opinion and thus political outcomes through media appeared in the face of what is now recognised as one of the world's most notable failures in conservation: the continuing destruction of a global nature 'superstar'. We suggest in this chapter that such public acts are often rendered futile because of a poor understanding of the communicative processes underpinning the research-to-policy pathway. This is troubling given the risks some scientists – working within expectations of independence and measured professional response – take when entering public debate. But this is only part of the story. While many scientists do not have the necessary communication skills or knowledge to join controversial debates (Besley & Tanner, 2011) or have been

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burned by previous experience (Dunwoody, 2015), there is also evidence that others see themselves as remote from the public sphere, a messy space of negotiation and contest that has a clearly troubled relationship with fact (Besley & Nisbet, 2013; Dudo & Besley, 2016; Simis et al., 2016).

In this chapter, we highlight aspects of this disconnection between environmental science and public debate and policy outcomes from a media and communication perspective. We begin by briefly outlining recent approaches to mediated environmental communication. We then turn to the communication of science more specifically. We argue that models of science communication and public engagement with science need to more explicitly acknowledge issues of power, complexity and conflict within the context of the contemporary media landscape. To conclude, we offer suggestions for how science and communication can be better equipped to influence environmental debate and decision-making.

16.2 Mediated environmental communication

As a starting point, we need to recognise the inherently political nature of environmental and conservation sciences – that even at their least political, they seek to influence behaviours and outcomes, and at their most political they are resisting global pressures for intensified use of land and water and increasing demand for and movement of resources. The politics of the environment consistently test our capacity to civilly negotiate a shared future (Cox, 2012; Dryzek, 2013), whether that concerns the composition of our atmosphere or the fate of a small localised fishery (Murphy, 2017). That environmental activists and journalists are greater targets of violence than ever before in many parts of the world is evidence not only that resource management and conservation are areas of conflict, but that what is said, how and to whom clearly matters (Cottle et al., 2016; Lester, 2017). Media and communication are central to this flow or containment of environmental information and meanings. As such, here we briefly outline key ideas from communication and media studies as they relate to environmental debate and decision-making.

As others before them, media and communication scholars have turned to nature for useful metaphors to help describe some of the dynamism and complexity they now witness. 'Media ecology' is a popular term to capture the interconnection of various media systems, platforms, technologies, genres, formats, and producer and audience practices driving media production and distribution (Altheide, 1994; Singer, 2018). How, and to what extent, this metaphor should be applied remains contested (Maxwell & Miller, 2012; Lester, 2019). Nevertheless, a focus on interconnectivity within media and communication is useful in highlighting the interactions and dynamism of contemporary spheres for public and political negotiation (Habermas, 1989; Fraser, 2007).

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An immediate outcome of applying this metaphor is the redundancy of the definite article in relation to 'media'. Once it may have made sense to refer to 'the media' as a bounded entity, in which media companies hired journalists, editors and camera operators to produce information in the form of news and entertainment that was circulated via newspapers and broadcast outlets to readers and viewers. Now, the use of 'the' in front of 'media' is as anomalous as it would be if used in front of 'nature'. Media are no longer separable from our social lives or indeed our environmental futures (Deuze, 2012). Media shape and frame our everyday life, including political decisions. They are the principal means through which we form a shared understanding of the world and come together to debate and negotiate common risks and concerns.

A second outcome of recognising ecological-type interconnectivity within a media and communication context is the acknowledgement of interaction. It is almost impossible to isolate environmental concerns and risks and the decisions they prompt to a defined locality. When residents in Mackay, Queensland, protested against the impacts of the proposed port expansion on the Great Barrier Reef, they entered a world that stretched communicatively from their local newspaper, to a series of NGO-established hashtags, to transnational corporations that sell ice cream, to European banks, to a US president and his daughters, to international governance bodies (Lester, 2016; Foxwell-Norton & Lester, 2017). And back again. Claims by industry of a 'social licence to operate' can be challenged when an 'affected public' is no longer defined as those living within a 20-km radius of a development site. We might all consider ourselves affected when the future of the Great Barrier Reef is concerned, and media and communication provide us with the means of engaging, and the sense that we have a right and duty to be involved openly in decisions about its future (Volkmer, 2014).

Dynamism is the third element to be considered. As the traditional business model for the production of news has collapsed, numerous other forms of information production and circulation have emerged. All are constantly adjusting and changing their practices in relation to one another. NGOs collate and publish information on illegal logging in places where it is now too dangerous or expensive for income-losing news organisations to send their journalists. Citizens establish community websites for local audiences or single-issue blogs for targeted business readers. News outlets campaign on climate change to attract subscribers, or do not cover climate change at all if it attracts too few site visits. Other media outlets closely guard a political and/or conservative readership, muscling out potential competitors with tactics sometimes bordering on bullying, in order to maintain a reputation for political influence (McKnight, 2012). Meanwhile, audiences have more choices than ever on what news they will receive and via what platform, self-selecting, re-selecting

and screening sources, topics and subject matter via news feeds, hashtags and new sites selection.

Power plays a key role in structuring this interconnected, interactive and dynamic system. Within media and communication, power appears in diverse and often surprising forms, and even ownership of mega-media companies is no guarantee of uninterrupted influence, as both Rupert Murdoch and Mark Zuckerberg have experienced. Power is never certain, although it holds true that some conditions enhance the capacity to control information as it travels. Information emanating from institutional settings, such as universities, scientific organisations, courts, parliaments or international governance bodies, can often travel with authority for longer than NGO-sponsored communications. However, the long-running clash in the Southern Ocean between the NGO, the Sea Shepherd Conservation Society, and the Japanese government-backed whaling fleet provides an excellent example of how geography impacts this. Throughout much of the conflict, Sea Shepherd was able to capitalise on the remote location of the conflict, from which journalists were absent, by producing and distributing images and messages that circulated within media relatively unchallenged. Symbolic power is key here. No amount of Japanese government-sponsored public relations or 'scientific knowledge' was able to successfully counter the messages carried by the bloodied corpses of 'charismatic megafauna' (McHendry, 2012; Cox & Schwarze, 2015).

Environmental NGOs have pioneered the strategic management of symbolic power within media and communication, and here conflict is often a necessary component. Sophisticated multi-pronged campaigns with minimal financial resources have threatened and interrupted the multimillion-dollar flow of goods and capital. The campaign aimed at Japanese buyers of Tasmanian native timbers involved a young woman in a tree with a laptop and a daily blog (albeit for over a year); a string of social media-active international backpackers and celebrity visitors; a single campaigner in Japan translating various media texts; and access to the email addresses of key corporate and social responsibility personnel in relevant Japanese companies (Lester, 2014). The Sarawak-based forestry company at the centre of the trade quickly altered its business practices in Tasmania once the Japanese companies withdrew from contracts rather than be seen to be failing to meet their own environmental procurement principles.

This terrain is media saturated, and the role of media and communication is more than mere conduits for data or messages. Modern environmental conflict is hugely influenced by media, as the 'product of mutually constitutive interactions between activism, journalism, formal politics, and industry' (Hutchins & Lester, 2015, p. 339) enacted in the public sphere. Activists' strategies and campaigns, journalistic practices and news reporting, formal politics and

decision-making processes, and industry activities and trade coalesce to enact moments of environmental conflict in public view. These moments of conflict largely centre on the legitimate dimensions of local, national and international policy and law, underpinned by the pursuit of environmentally sustainable development (Konkes, 2018; Foxwell-Norton & Konkes, 2019).

For example, state, NGO and industry responses to Japanese whaling conflicts in the southern oceans drew heavily upon the duties of signatories to the International Convention for the Regulation of Whaling, that for over 30 years has delivered a commercial whaling moratorium. Sea Shepherd undertook protest action, with international laws and policy aiming to deliver whale conservation underpinning its media-based efforts, holding nations and industries to institutional and public account. Science was used both to support conservation via the International Whaling Commission (IWC) and to challenge it via the research claims of Japanese whaling fleets. Meanwhile, the IWC's pursuit of conservation management plans, sanctuaries and marine parks has been underpinned by science that seeks to balance whale populations with the impacts of industry, even when not explicit. Science and scientific knowledge are thus very much a part of these conflicts, powerful, contested factors in contemporary social relations.

Media and communication form an interconnected, interactive and dynamic system, in which power, conflict and threat to established practices and order are always evident. As with any complex ecology, this is delicately balanced and easily interrupted, constantly adjusting and shifting as its component parts struggle for sustainability and/or dominance. They remain integral to the formation of public opinion and the political influence that follows, but contemporary flows and networks of information make the paths from source to policy more difficult to predict than ever. In the next section, we contrast this view of media and communication with that circulating around environmental sciences.

16.3 Communicating environmental sciences

If the view we have presented of media and communication is of a highly political, dynamic and complex system – one that is central to social life and environmental decision-making, but that does not easily lend itself to being understood or charted via neat models – the environmental sciences can present a near opposite view. Communication here is often an add-on activity, and 'the media' considered a relatively stable platform or tool to deploy as needed in order to change public opinion and produce policy outcomes. Indeed, a key premise in recent literature is the idea of 'protecting science communication' from the dynamism and noise characteristic of public debate and controversy, and of an active separation of science communication from political communication (Hall Jamieson, 2017; Kahan et al., 2017). Here,

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'science and its communication' rather than 'communication and its implications for science' has underpinned scholarship, leaving science seemingly remote from, rather than a part of, the public.

In considering how this situation has developed, we turn to a subset of literature that is not so interested in public understanding of science as scientists' understanding of 'the public'. In a review of findings from surveys of scientists, Besley and Nisbet (2011) found that, when asked about the role of the public, 'scientists may opt for some type of co-decision-making but also suggest a desire by scientists to differentiate themselves from the public'. Their relevant findings include the following.

- Scientists say the main barrier to 'greater understanding of science' among the public is lack of education. Media are second.
- Scientists see the public as homogenous – although experience interacting with the public can bring a more nuanced view. Scientists perceive policy-makers as the most important group with which to engage, with the public in the mid-range of importance – somewhat more important than young people or NGOs, but less important than the private sector and educators.
- Scientists appear to rely on a simple sender–receiver model of media effects that fits poorly with contemporary media research, that is, they 'tend to favour one-way communication with the public via the media, viewing engagement as chiefly about dissemination rather than dialogue' (Besley & Nisbet, 2011, p. 653).

Overall, scientists are willing to engage directly with citizens but 'such engagement is usually still framed in terms of providing information' 'to increase citizen knowledge' (Besley & Nisbet, 2011), while addressing the knowledge deficit and/or 'scientific literacy' still dominates scientists' communication goals (Peters & Dunwoody, 2016).

This transmission model of communication (Shannon & Weaver, 1949) – underpinned by a desire for a clear channel of communication that protects the message on its route from sender to receiver – has serious implications for public understanding, awareness and/or engagement with conservation and other sciences. It epitomises frustrated attempts to eliminate 'noise' – that is, to control the 'message' on a path to the public or policy and decision-makers. In the case of science, and more specifically conservation and ecology, the greatest 'noise' is the sound that resonates in the public sphere when citizens and scientific expertise collide. Exploring this noise requires a thoughtful and critical examination of the structural characteristics of this collision, and how this may impact the passage of scientific knowledge to citizens. This is difficult work, occurring in a space where diverse publics and communities with a range of understandings about scientific expertise and/or the primacy of economic imperatives reside.

Instead, a range of contexts, influences and often conflict await the path of scientific knowledge to the public. Public understandings of science cannot be divorced from these social processes, and a 'pure and protected' science message, unsullied by politics, is unlikely to arrive untouched at its destination audience.

Citizens enter the public communication of science as social, political and cultural beings with a range of historical and contextual nuances. The underlying assumption of communication as mere transmission of data – as a controllable process – will often fail to register the impacts sought and may act to reinforce the communicative distance between scientific expertise and the citizens to whom their message is directed. While some effort has been made to abandon communication models that are based upon 'knowledge deficit', the model is still evident in many attempts to distribute scientific research and findings to the public. A carefully crafted tweet, a multimillion-dollar documentary or a full-page advertisement framed by 1200 years of expertise and experience of Great Barrier Reef scientists or equivalent is communication that often underestimates the conditions within which these citizens reside. What is heard by the public can be quite distant from the sender's intent.

16.4 Better conservation communication

We suggest some key strategies that might help in the communication of conservation. The starting point must be a consciousness of one's own role – a critical self-reflexivity – that positions science and its communication as only one of many domains of legitimacy and authority in conservation debates and efforts. There are other sources that carry legitimacy and authority in the public and private lives of individuals, institutions and their societies and these also command a place in public communication about conservation. This 'communication noise' cannot be bypassed and is indeed a distinctive characteristic of the current era. When conservation science enters this messy sphere of debate, it becomes enmeshed in the public realm of politics and political communication. Efforts to 'secure' a message to an audience, even via the expensive production of one's own media content, underestimate communication's complexity and unstable networks of connectivity. Seeking innovative collaborations with communication scholars, and inviting their meaningful participation in the constitution and design of research projects, is one way in which conservation scientists might better prepare their work for public deliberations.

Popular messages are not necessarily wedded to scientific rigour, expertise or fact. In the twenty-first century, scientists are encouraged to communicate their knowledge widely, making it increasingly susceptible to challenge and disrepute. An understanding of how science is embedded and implicated in

processes of public debate and negotiation may reorient these communication strategies. For example, by prioritising the scientific and economic imperatives to protect the Reef, as evident in our opening example, the scientists could actually have affirmed the powerlessness of the public in relation to the destruction of the Reef, especially when even experts are compelled to take out full-page advertisements in a state newspaper. Conversely, communicating the Reef as a scientific fact and an economic resource may alienate already marginalised public sentiments that do not prioritise this message in their own experience of or relationship with the Reef.

Further, when scientific messages are framed with deliberate reference to the 'economy', including the tourism and mining industries, the impacts of mining and tourism on the Great Barrier Reef and the science are (again) diluted by a perhaps unwitting collusion with industry – as has been repeated in the history of Reef policy and protest moments (see Foxwell-Norton & Lester, 2017; Foxwell-Norton & Konkes, 2019). Conservation science may do better to elevate the impact on the Reef's ecology, and return to its messages of connectedness between human and natural systems. Is the Reef not worth protecting in itself? In the 1960s, the emergent discipline of ecology was evoked to argue that a mining lease on one part of the Reef would have dire consequences for the entire Reef ecosystem (McCalman, 2013). This ecological approach requires ongoing critical reflection on the concept of 'ecologically sustainable development' and the relationship of research to a system of industrial development that threatens ecologies everywhere (Redclift, 2005). Suffice to say, much public trust in science is at stake in these reflections.

In the longer term, better conservation communication can also be fostered in training and development. The distance between the 'two cultures' or, more specifically, the humanities, arts and social sciences and that of the science, technology, engineering and mathematics disciplines, is shrinking, but not fast enough. Clearly, neither 'culture' alone is sufficient to arrest the current trajectory of ecological decline. As researchers, we must continue to challenge false dichotomies that diminish scholarly contributions to conservation efforts – from global superstar ecologies like the Great Barrier Reef to the local ecologies of the places we live (Foxwell-Norton, 2018). This distance can also be lessened in the design of degree programmes and training courses, giving current and next-generation science communicators access to different ways of thinking about their role, their potential place in public sphere debate, and the public.

In the twenty-first century, where networks of communication link individuals and civic institutions through digital media and mobile communication, a sophisticated understanding of communication is power (Castells, 2013). Communication scholars are well-equipped to assist scientists, and their

disciplinary communicators, to extend existing understanding of communication, media and journalism. This entails a re-examination of what is meant by 'science communication' and its current strategies to engage citizens in support for, and trust in, its work and expertise. Currently, such collaborations overwhelmingly favour scientific expertise, leaving communication expertise (beyond media industry experience or production expertise) underrepresented, despite its potential to add critical dimensions to scientific research and projects. Deeper collaborations could better explore the challenges and capitalise on the opportunities that emerge where communication is pervasive, ubiquitous and complex.

16.5 Real 'citizen science'?

In liberal democratic societies, science enters the public sphere of debate with a menagerie of mitigating concessions and qualifications. Conservation ecology and science communication that seek to engage the public cannot be protected from these complexities: they are *sine qua non* to human societies. Communication between science and citizens in the twenty-first century is further impacted by the complex, interconnected network of communication technologies, practices and transnational flows characteristic of the modern experience. The public sphere that scientific knowledge enters is not a level playing field for all participants. Even 'pure' science messages are exposed to the unevenness wrought by conflict involving power, wealth, industry and politics.

Our Reef scientists and the scientific community are clearly attuned to the power of media in addressing environmental conflict and the public, hence the advertisement. We have questioned, however, whether such a blunt tool underpinned by a transmission model of communication is likely to result in the protection of the Reef intended by these scientists. We assert that messages, even those that seemingly carry the credibility and authority of scientific expertise, are confused and contorted by 'communication noise'. This embeds science in the dirty politics of public sphere debate, rather than beyond the politics of knowledge, position and power. Early communication scholar John Dewey expressed these ideas at the turn of the twentieth century:

> Society not only continues to exist *by* transmission, *by* communication, but it may be fairly said to exist *in* transmission, *in* communication. There is more than a verbal tie between the words common, community and communication. Men live in a community in virtue of the things they have in common; and communication is the way in which they come to possess things in common. What they must have in common in order to form a community or a society are aims, beliefs, aspirations, knowledge – a common understanding – like mindedness as the sociologists say. Such things cannot be passed physically from one thing to another like bricks; they cannot be shared as persons would share a pie by dividing it into physical pieces.
>
> (Dewey, 1916)

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Opportunities are repeatedly missed and frustration grows in part because communication is assumed, and the scientists' 'camera' faces out when what is needed is a science 'selfie' – a critical self-reflexivity capable of understanding not only the science but how science might be heard once it leaves the minds of experts and enters the community (Foxwell-Norton, 2018). Understanding this requires 'knowing thyself' as a product of a peculiar set of historical circumstances that have legitimised and given authority to scientific messages but also as part of the politics of the public sphere – where citizens (including scientists) reside and knowledges circulate. Citizens must be the target of science messages in order to shift voting behaviour for a politics that gives due reference and regard to best conservation practice. This is clearly, from a communication perspective, the terrain upon which the Reef scientists are operating, albeit unconsciously. The core problem is that science communication understands itself, and largely gathers its authority and legitimacy, by defining its terrain in terms of 'science' rather than communication.

Science communication is very clear about the merits of bringing science to society, but is found wanting in the reverse, of the importance of bringing society to science. This is a tragic flaw, especially relevant at the current juncture when communication networks mean science is everywhere, visible and not, elevated and undermined, in every moment in society. As a starting point, there are a few key strategies that can begin to mitigate against the repetition of the 'communication breakdowns'.

- Improve scientists' understanding of the ways in which their knowledges enter the public sphere of political debate and the politicised nature of their own knowledge.
- Acknowledge that conservation science is understood by the public in terms mostly not answerable to, or cognisant of, scientific rigour or research.
- Enter the arena of media-immersed environmental conflict willing to participate alongside and through other interests of politics and decision-making, including activist groups, industries and government.
- Accept there can be no divorce of any aspect of conservation science from these politics, as it hampers meaningful engagement between science and its publics.
- Take the 'scientific selfie in society' that shows the flaws, the unknowns and the occasional exhilaration.

A thorough and candid examination of the relations between citizens and scientists in a media-saturated society is, we suggest, extraordinarily hard science. It is, however, science that is critical to the development of new directions in the public communication of conservation science.

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