



The Role of Civil Society in Recalibrating Conservation Science Incentives

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The gap between research and practice is well known in environmental sciences and policy, particularly by practitioners. It is one thing to define important research questions and set priorities (Sutherland et al. 2009; Fleishman et al. 2011; Braunisch et al. 2012); it is quite another to create the right incentives to pursue them.

Pressure to publish in top-tier, disciplinary journals is intense (Card & DellaVigna 2013). And because top-tier journals reflect the insular nature of the scientific process, where excellence is defined by novelty, elegance, and conceptual advance, rather than specific, applicable solutions to difficult problems, decks are often stacked against scientists exploring areas with immediate policy relevance. There is clear recognition—both within some academic institutions and within civil society organizations—that this condition reduces the impact and relevance of science on conservation policy and practice (Uriarte et al. 2007).

Civil society organizations depend on knowledge creation from academic disciplines. If or because these organizations want a larger portion of academics to work on solutions to difficult problems with immediate relevance, they need to reduce the direct and indirect costs of that relevance. Civil society must provide stronger and more creative incentives to bring disciplinary experts together around the complex issues that will have the greatest impact on conservation success, and they need to work harder to define and communicate what these complex issues are.

This issue extends beyond conservation, and in other domains, substantial investment has been put into building appropriate incentives. Examples include solution-centered competitions in global health and development (Novy-Hildesley 2010), prizes for grand innovation challenges (Brunt et al. 2012; Murray et al. 2012), and young innovator awards.

Conservation communities can learn from these models, though clearly not without adapting them. Conservation issues are diverse, and many of the most important require coordination across many disciplines.

Consider one example: An up-to-date, evidence-based estimate of the social cost of carbon would greatly benefit efforts to update government rules for the mitigation of climate change. For years, practitioners have been calling for collective effort, but progress has been slow. This is not surprising. Solutions to this problem will require large-scale research programs bringing together climate modelers, natural scientists, economists, and a host of practitioners. Without practical structures and incentives to support this work, such broad collaborative research is unlikely to attract top academic talent; opportunity costs are high, due in part to the coordination required for effective work across institutional boundaries (Cummings & Kiesler 2007). Thus, some of the most prominent economic models for the impact of climate change use climate damage estimates that have long lagged behind the latest science and that underestimate the full damages (Kopp & Mignone 2012). The official U.S. estimate for the social cost of carbon is just shy of \$40/tons of CO₂ (U.S. Interagency Working Group on Social Cost of Carbon 2013). That is, in fact, almost twice as high as 3 years ago (Greenstone et al. 2013). Yet some unofficial estimates suggest the true cost may much higher still (Pycroft et al. 2011; Ackerman & Stanton 2012; Dietz 2012; Kopp & Mignone 2012). This discrepancy has important economic and environmental consequences for setting policy, where benefit-cost calculations rely on the social cost of carbon for estimating the benefits of new and existing rules. Only now are we seeing emerging research examining the knowledge gaps in each relevant sector, a step often brokered by civil society.

Any path forward will require increasing the pace of change in academic reward systems (Uriarte et al. 2007) through closer collaboration between practitioners and academic researchers, with much of the burden resting on the former. Civil society organizations need to use their convening power, audience outreach, funding capacity, and unique data to help shift research-funding priorities and expand the academic mandate (e.g., Colón-Rivera et al. 2013). All of this also helps spur researchers to answer immediately relevant policy questions and to work to create change from within rather than outside traditional academic incentive structures.

One incentive is money. More funding is the most direct path to closing the incentive gap, but it is not a complete solution. Because the needs of conservation sciences are cross-disciplinary and collaborative and the deliverables often fall outside traditional academic success metrics (publication in high-impact journals), funding alone may not be effective. Academic disciplines are largely built on reputation economies with strong social backbones. This characteristic of academia points to the value of creating and sustaining networks that increase the national and international status of academics interested in maximizing the relevance of their work.

Civil society may be best served by attracting the attention of early-career scientists and by establishing agile partnerships. The most important commodity for young scientists is time: US graduate students take 7–8 years on average to get their PhDs (Hoffer & Welch 2006). A good portion of that time is spent identifying research questions and collecting data. Putting more emphasis on organizing, curating, and communicating access to questions, data, and field support for research could allow civil society organizations to engage emerging academic talent with the questions and issues with the greatest capacity to create change.

Besides money and access to data, another successful model is that of small, focused working groups that connect experts on a particular set of questions. These are not conferences; rather, they are groups focused on synthesis. Such working groups reduce the costs of collaboration across disciplines by repeatedly bringing people together in intense working environments (Hampton & Parker 2011). In the natural sciences, the working group model of collaboration and synthesis was popularized by the U.S. National Center for Ecological Analysis and Synthesis, and it has since been repeated in other countries and across disciplines (e.g., the Synthesis Centre for Biodiversity Sciences in Germany, the Center for Synthesis and Analysis of Biodiversity in France, and the National Socio-Environmental Synthesis Center in the United States). Environmental NGOs are beginning to use similar models to focus and incentivize policy-relevant research, from the Luc Hoffmann Institute at the World Wide Fund for Nature and the Science for Nature and People collaborative of The Nature Conservancy, the Wildlife Conservation

Society, and the National Center for Ecological Analysis and Synthesis to the emerging issues workshops and academic collaborations of the Environmental Defense Fund. These efforts are being complimented by university-led initiatives, such as the Cambridge Conservation Initiative, which combines the collocation of NGOs on campus with strong financial incentives for collaborative research.

The collaborative work models driving these efforts should be strengthened and replicated, with the aim of producing and sustaining communities of academics and practitioners that gain as much from their collaboration on cross-disciplinary issues as they do from their disciplinary work. Meeting this goal will require careful consideration of the successes and failures within the science policy interface, ranging from stronger coordination with intergovernmental efforts, such as the Intergovernmental Platform on Biodiversity and Ecosystem Services (Pe'er et al. 2013), to greater engagement with research groups, such as the Science Policy Interface Project (SPIRAL), that focus explicitly on promoting a more effective interface between science and policy communities (Young et al. 2013). Successful collaborations will allow NGOs and academics to react more quickly to emerging policy issues and provide a stronger, evidence-based position for decision making. Connecting these seemingly disparate communities and aligning research priorities with research needs will create solutions with benefits for civil society, academics, and the science and practice of conservation.

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